ANÆSTHETIC DIFFICULTIES

AND

HOW TO COMBAT THEM.

BY

A. DE PRENDERVILLE,

Member of the Royal College of Surgeons, &c., &c.; Senior Anæsthetist to the Tottenham Hospital, N.; Anæsthetist to the London Throat Hospital, W.; Lecturer on Anæsthetics to the North-East London Post-Graduate College.

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ANÆSTHETIC DIFFICULTIES AND HOW TO COMBAT THEM.*

In the present article I propose to discuss some practical points in connection with the subject of difficult anæsthesia, or, rather perhaps, the difficulties that may and do often arise in an anæsthetic sequence. I cannot hope in the time at my disposal to treat so large a subject exhaustively. Nevertheless, there are many points calling for serious attention which come before us constantly in daily work, and with these I shall endeavour to deal in detail, being well assured beforehand of your earnest interest, as practical men, in the matters at issue.

Anæsthesia, for long years after its first inception, was treated largely as a haphazard science, charged with sudden and uncertain dangers, the meek hand-maiden of the surgeon, who claimed its aid indeed with ardour, but who mistrusted its late results almost as much as he admired its instant triumph. To-day it stands forth a fine art. The problems which puzzled and at times even baffled original investigators, have nearly all been solved by patient labourers in these later days, and now fearless and undismayed, but ever wary, we steer a safe course between the Scylla of ignorance on the one hand, and the Charybdis of mere chance on the other.

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*A Paper read before the North-East London Clinical Society, at the Tottenham Hospital, on March 2nd, 1905.

So much, then, for anæsthesia in the abstract. All experience teaches that in matters surgical the best results follow a careful preparation of the patient, and this rule applies strongly in anæsthesia. It often happens, of course, that the instant demand for operation will preclude any but the most hasty attempts in this direction, but putting aside cases of extreme urgency, and unfortunately they are neither few nor infrequent, careful preparation is the keynote to easy and successful narcosis. If this would seem to be so self-evident as to be almost a hoary platitude, let me hasten to add that the rule is often carelessly observed, or perhaps, I should say, not firmly enough insisted upon. In hospitals a routine method always obtains, but in private, unless the medical attendant gives clear and precise directions, and sees that they are rigidly enforced, well-meaning but ignorant friends will frequently steal a march on him, and leave to the unhappy anæsthetist the final duty of wrestling, may be, with a rebellious egg or an equally rebellious bloater!

> Small wonder, then, that he, poor man,
> Distraught to find his efforts vain—
> Takes refuge, perhaps, in ancient Greek,
> Or piquant language of Cockayne.

If the operation be fixed for early morning, order the last meal to be taken at eight the previous evening. For operations that take place in the early afternoon, a preliminary abstinence of five hours will suffice. This, then, should be the rule, applicable generally for patients of good stamina and of full age. The weakly and those whose physical powers have gone down through blood-loss or prolonged illness, will need a wide modification of treatment. Solids, however, should, in all circumstances, be rigidly withheld, and only that form of liquid nutriment allowed which can be easily and rapidly absorbed. As to

purgation before general anæsthesia, opinions differ. It were better in many cases to rely upon an enema at the penultimate moment than to run the risk of causing intestinal disturbance by pilling the patient overnight. A costive habit will require preliminary treatment so as to cause no trouble on the eventful day itself. There is danger often in a full stomach, but not necessarily in a loaded rectum. They should both, however, be dispensed with from every point of view. Now, happily for ourselves and for our prospective patients, we have arrived at that stage of anæsthetic wisdom whereby certain definite prognostications can be indulged in as to troubles likely to occur during the narcotic period. We know, for instance, that strong jaws and good teeth, combined with muscle power above the normal, mean trouble and much resistance to the firmest efforts of the administrator; we know also that *tobacco* and *alcohol* portend storm and stress, and every imaginable artifice subconsciously displayed to delay the inevitable. The hooligan of commerce, and of the School Board, together with the florid country wench, and the burly satellite of Bung—these are types, however admirable in our social system, of whom we must beware when once we find them lying supine on the couch of pain. For these, and those akin to them, we must gird up our loins and have at hand the gentle suasion of strong arms and well-trained nurses. And so we dub them types, and, being forewarned, are, wisely, well fore-armed.

The anticipation of difficulty in any given case will obviously be a matter of moment to us, and, indeed, a great help in arranging our attack. Hence, the need of a careful if rapid survey of our patient before the induction of anæsthesia. Assuming, then, that we have a subject to deal with who approximates to one or other of the types I have spoken of, we have to decide what fundamental anæsthetic,

or, alternatively, what sequence, will best do for our purpose. Shall we use chloroform alone, or ether alone, chloroform and ether together (please delete the alcohol), or, rather, shall we select a sequence—nitrous-oxide ether or ethyl chloride-ether and chloroform? The final verdict must rest with the anæsthetist, but in this matter it is well, I think, if possible, to study the individual indiosyncrasy of the operator. He, too, has grave duties to perform, and will of necessity have formed definite opinions in regard to the suitability of certain methods of narcosis for certain special conditions. The object aimed at is the harmonious blending of many interests, and, in my view, this is often best arrived at by a happy compromise or complete unanimity as to the procedure to be observed.

And though this, in my opinion, is the plan that works best in special practice, I strongly urge upon you the adoption for general work of that fundamental anæsthetic which all experience has shown to be the safest. Ether, therefore—and preferably the nitrous-oxide ether sequence—should, in the absence of marked contra-indications, be always selected as the routine anæsthetic for the induction of general surgical narcosis. One thing, and one thing alone, has barred the way of ether, viz., the difficulty of administration; chloroform is so easy, so painfully easy, by comparison. A strip of lint, or the corner of a towel, and the patient is off—sometimes never to return! With Ether there is a cumbrous cylinder to handle, and an indicator to move through half a circle, and much backing and filling and general turmoil, the while the patient splutters and coughs and tries by every device, holy and unholy, to wrestle free from bondage and impending suffocation. It is, I admit, no easy matter to become proficient in the gentle art of ether giving, but it is worth the learning and will repay those who seek for *safety*, and are well content

to tread the thorny path that leads to it. But when all is said and done, anything that is worth doing at all is worth doing well, and with this aphorism in mind we may now proceed to discuss—

Difficulties to be met with in Etherisation.—Chiefly on account of the irritating nature of ether vapour, there is a marked tendency to cough during the initial stages of induction, and, as a consequence, engorgement of all the structures about the head and neck may easily follow. Moreover, with continued expulsive efforts of this nature, all hopes of fully narcotising the patient would have to be abandoned, because the amount of ether absorbed would be so small as to be practically useless for our purpose. I am assuming, of course, that we are dealing with a case quite free from bronchial trouble, but possibly not free from chronic pharyngitis or some degree of nasal stenosis, the result of hypertrophic rhinitis or adenoidal growths. Ether given alone is much more liable to cause cough than if given in sequence, and hence the value of nitrous oxide to begin with. This agent paralyses reflexly the nerve endings in and about the pharynx, and paves the way for us.

One great cause of cough is, I feel sure, the admission of too much air in the early stage. My own plan is as follows: I fill my gas bag, detach it from the cylinder, and fit it to the "Clover" already charged with ether. After one or two respirations I turn on N_2O, and allow the patient to half empty the bag. The face-piece meanwhile is held firmly to the face, with ether indicator fixed at 0. With N_2O bag half emptied, I close the expiratory valve and turn on ether, slowly rotating the indicator until point 2 is reached. If possible, I exclude air entirely for one and a half minutes, then open inspiratory valve for fraction of a second, and repeat this air dosage every four

or five respirations until, at the end of two or two and a half minutes, I exchange the gas bag for a small supplementary ether bag. The patient is now well dosed with gas, and slightly with ether. He is also more or less cyanosed. It is precisely at this point in my experience that cough already abolished may reappear, and this for two reasons—(1) because in the interchange of bags too much air may be admitted, and (2) because the effects of N_2O rapidly wear off and etherisation has not yet advanced far enough to control the coarse reflexes. If you turn back the indicator from 2 to 1 or ½ or even 0, and begin *de novo*, so to speak, the chances are that your patient will get up and look at you, and thus all your previous gain will have been lost. My own plan is to keep the indicator half-way, to open the slotted valve in the angle mount of the ether bag, and to await developments. I regulate the air supply entirely through the slotted valve, and rarely move the face-piece at all.

Should either vapour be ill borne at this stage, and set up cough and venous engorgement, I lessen the intake momentarily, and watch carefully for an opening to again increase the supply. But rarely do I find it necessary to lift the mask, and still more rarely, if I may say so with becoming modesty, do I cyanose the patient. Late cough is usually a sign of light narcosis and returning consciousness, and must be dealt with by pushing the anæsthetic. It need not delay us now.

Early and deep cyanosis is a difficulty to be at once dealt with and corrected; it may arise from several causes and is nearly always due to mechanical obstruction of the airway. Incurving of the lips in edentulates, spasmodic contraction of the masseters, with consequent tight clenching of full-toothed jaws, recession of a bloated tongue, with resulting closure of the glottis—these are difficulties

peculiarly associated with etherisation, and may readily lead to grave danger if unrelieved.

I need say nothing of the treatment to be observed in these crises, for you know as well as I do that the fair airway must be promptly restored, and that this can only be done in one way—by promptly opening the mouth, *vi et armis* if need be, and seizing the tongue should this unruly member be at fault.

It is surprising what an ugly customer the tongue can be, and is, in some people—I mean from an anæsthetic as well as from an æsthetic standpoint. An old toper, and, I regret to add, for the honour of tobacco, an old smoker, and still more the humble devotee of the delectable quid, will often present to view a lingual organ of Titanic mould, clothed not, indeed, in white samite, but withal mystic, wonderful—broad-based and thickened, with root as gnarled and threatening as the head of an Irish blackthorn. Beware of such a tongue! It may give you much anxious care.

I have said nothing so far about *decubitus* in ether giving, but it is so important that I must now remedy the omission. For general anæsthesia, the *supine* is the classic position. True, there are many exceptions to this rule in modern operative work; with these exceptions we shall not deal now. Whatever the pose selected, there is one law that always obtains—

The head must be in the same plane as the trunk. Extreme extension, and conversely extreme flexion of the head, will inevitably result in blockage of the airway. Some operators in removing post-nasal growths bend the head over the end of the table, and in tracheotomy, as in other conditions, extreme extension may at times be necessary.

These procedures are, however, of short duration, and

are, in reality, exceptions that prove the rule. Of the two evils, flexion on to the chest is the greater, especially in fat people; in these cases when diaphragmatic movement is limited, lifting the chin will usually suffice to restore free breathing, but it may be necessary also to push forward the whole lower jaw at the same time by pressure on the angle. This manœuvre helps to clear the base of the tongue from its temporary attachment to the pharyngeal wall. A faulty position will give rise to no end of annoyance and discomfort unless speedily rectified, and may, indeed, jeopardise the harmony of the anæsthesia altogether. Constant watchfulness and attention to minute details will alone secure in many cases a happy issue out of pain and perils.

I will say one word about the special pose of gynæcological surgery. I refer to the Trendelenberg position. You have many chances of seeing it here in full operation, and I sincerely trust you have been duly impressed with its inherent and its potential difficulties from the anæsthetic standpoint. It is sometimes almost impossible to obtain a perfectly smooth sequence, unless ceaseless watch be kept over the respiration and every artifice known be used to secure a free airway. It may be and often is necessary to push the narcosis to the utmost limit of safety, in order to get sufficient muscle relaxation for the surgeon, or to abolish awkward reflexes at critical moments.

You can readily see that even a temporary check to respiration may easily induce spasmodic movements of the diaphragm, and hamper the operator materially; there is an added danger in these circumstances, for any marked change in respiratory rhythm may bring about sudden engorgement of the right heart, and lead in an instant almost to the very—

"Brink of that abysmal void whence none return."

Therefore, I say, be watchful of every move in the Trendelenberg position. If with head correctly poised there is still impaired breathing, look for the cause. Do not hesitate to gag the mouth permanently, and to hold the tongue well forward, if by so doing alone you can secure an equable and safe narcosis. Above all things, regard the safety of the patient, immediate and remote, and to this end hold up the jaw throughout an operation, if no other means will serve to secure a correct position of the head. It is tiring work to attend closely to a Trendelenberg during prolonged abdominal section, but somehow time seems to fly on these occasions, and possibly one only realises the effort involved, and, parenthetically, the amount of ether absorbed, at a much later hour in the day, when under the soothing sway of the great god Nicotine, we rest at last from our labours.

Some special difficulties may arise during the administration of *chloroform*, which I will now refer to.

Of prime import is a knowledge of the factors that make for danger in chloroform narcosis. *Fear*, deep-seated and abiding, the result perhaps of sleepless nights and eternal introspection, or even the natural outcome of a highly-strung temperament—this is a factor that has to be reckoned with if you elect to rely on chloroform *ab initio*. I distinguish this condition from *fright*, which is, I take it, a momentary phenomenon chiefly met with in children, and then only the result of new and unlooked-for surroundings. There are people who come to the table calm, as it were, outwardly, but with fixed premonition of impending doom strong upon them. Many cases are recorded of sudden death from the mere application of a mask to the face, before even one drop of chloroform has been given. True, the heart has been diseased in 90 per cent. of these casualties, but for the remaining percentage no physical

cause has been assignable. If fear, therefore, unaided will strike so deadly a blow, we may well imagine the danger of adding fuel to fire by the exhibition of so lethal a drug as chloroform. And yet there are cases in which it will be possible to use this agent alone. How, then, are we to act?

Recent research has clearly shown that the greatest danger is to be met with at the outset of the administration; *irritation of the vagus* is peculiarly liable to follow initial absorption of chloroform vapour, and thus we may get sudden inhibition of the heart and death. *Paralyse the vagus* and all will go well. Hence it follows that extreme care must be taken to so regulate the dosage that only very dilute chloroform vapour be absorbed by the lungs, that no attempt be made to force matters unduly, and against a struggling patient, that respiration and the pulse be closely watched, and as narcosis gradually deepens, that more of the anæsthetic be added, until we are satisfied insensibility of the desired quality has been reached. It is wrong physiologically and in practice to begin the attack, as is so often done, with a large overdose, in the hope of inducing rapid unconsciousness. We have changed all that, and though our methods may still be somewhat inexact, the labours of Embly and Martin have added immeasurably to our knowledge on this all-important subject. They have adorned the tale; it remains for us to point the moral.

It is not always easy to see the breathing during a chloroform sequence. Respiratory movements are slowly carried on, and there is little if any phonation to guide us. Moreover, the necessary coverings will sometimes almost entirely prevent accurate inspection of the chest walls. Means must be taken to obviate this difficulty by exposing the sternal notch, or so arranging the clothes as to give

opportunity for accurate investigation. This can always be done without creating attention or disturbing the even progress of events. Under no circumstances should more chloroform be given if, during deep narcosis, the breathing shows signs of impending arrest. The state of the pulse and pupils will be a guide as to future conduct.

It is well to remember that a very small pupil is not necessarily a sign of profound insensibility, nor is a small, rapid, irregular pulse in the absence of much blood-loss *ipso facto* a symptom of grave import. Both these phenomena, especially when associated with efforts at deglutition, may foretell vomiting; they indicate a light anæsthesia and must be met with an increase of chloroform and a deepening of narcosis, when the equilibrium will be once again restored.

Respiratory difficulties occur from time to time independently of mechanical obstruction, and it is well to be alive to this fact. Spasmodic closure of the glottis may take place reflexly, through undue stimulation of any large sympathetic plexus, and this difficulty may occur either with ether or chloroform; in my experience it arises oftener with chloroform, and is sometimes very insidious in its onset. Curiously enough, it is often best relieved by a change of anæsthetic, after pressure on the chest walls and diaphragm has first restored the respiratory balance.

Without doubt much greater care must be observed in dealing with minor troubles under chloroform than under ether. The danger of over dosage in ether is, after all, a remote one. With chloroform, on the other hand, toxic symptoms may appear with startling suddenness, and unless a man be quick to read the danger signals and prompt in resource, he may find the thread of life snapped before him, even in the twinkling of an eye. And yet we read of men who chloroform their patients for the

extraction of a simple molar or the cutting of a homely boil! Verily, they know not what they do!

Before finally leaving this subdivision, let me tell you of a very subtle danger which must be guarded against. There has been recently recorded in a coroner's court the details of a calamity which I make bold to say should not have happened. A patient under chloroform was being moved from one couch to another, the administrator holding the mask to the face throughout, when sudden death occurred, apparently at the very moment when final transference was taking place. It is no uncommon thing, of course, in busy hospital practice to anæsthetise in one room, and then to wheel the patient into the theatre; but this manœuvre is carefully accomplished on a stretcher.

With body absolutely supine, so as to interfere as little as possible with the movements of respiration, any change of posture must inevitably throw an added strain both on heart and lungs, and materially increase the danger of syncope. It is very easy under these conditions, if a saturated mask be held to the face, to give an overdose, and it cannot be too strongly insisted on that in these cases the anæsthesia should be intermitted until the patient is once more placed in position. Delay is of little consequence, and it is our duty to safeguard the life committed to our charge.

The danger of *exaggerated intake*—in other words, of *over dosage*—is often brought home to us in the anæsthetising of children. At times they struggle very violently and have to be forcibly restrained. So long as they refuse to breathe at all, there is obviously nothing to fear, but when once the relief of tears ends their short-lived rebellion, and spasmodic sobbing marks the beginning of reluctant surrender, then must we move cautiously, for respiration now proceeds apace, and if we be unmindful of

this fact, we may inadvertently allow an overplus of the narcotic to be absorbed. I have personally more than once met with this incident in my own practice, and I am free to tell you that it was a very unpleasant experience, and one calculated to leave a lasting impression behind.

Another very familiar example of possible danger by over dosage may occur in attempting to push the anæsthetic after vomiting. For various reasons, vomiting will come on now and again in nervous patients, in spite of every precaution as to abstinence from food and drink. All efforts to prevent it may end in failure.

We therefore withdraw the anæsthetic for a time, but soon return to the charge, as children rapidly recover consciousness in these cases. When, therefore, the administration is resumed, we must in the case of chloroform or C.E. begin with moderation. A fair airway now presents, and full narcosis rapidly follows a remarkably small intake. This fact should always be remembered in narcotising very young children and weaklings generally. The susceptibility to chloroform toxis cannot in any given case be gauged with any degree of exactitude, but this we know, that the greater the lung power the greater the danger of abnormal absorption.

Unquestionably, many untoward results may be attributed to a disregard of this very obvious and well-established fact, and if we choose to ignore it, we must not be surprised to find ourselves now and then perilously near a fatality. Ether, *au contraire*, can never act with sudden malevolence in this wise, unless, indeed, we push it to a dangerous limit during arrested or embarrassed respiration.

These, then, are a few of the many important points in regard to practical anæsthesia which merit our atttention, and which may very readily be brought before us in daily work. It may seem to you that there is much more to be

said, and, for that matter, many an important omission from this paper. I agree, but really, the subject is so large, and in some aspects so complex, that I have felt unable on this occasion to do more than point out broad principles for general guidance, dealing only with well-known and ordinary complications, and leaving entirely without comment those still graver crises which come—

"Like blinding fireballs hurled by giant hands"—

in the operative surgery of special regions. With these I shall deal on some future occasion, if the Society which has honoured me with its attention to-day so desires.

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