ANÆSTHESIA FOR THE POOR RISK

MUSHIN

ANAESTHESIA FOR THE POOR RISK

and Other Essays

BY

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ANAESTHESIA FOR THE POOR RISK

To my Wife

THE GOOD PROVIDER OF THAT INESTIMABLE THING
A TRANQUIL HOME

PREFACE

AS the weeks go by, paper after paper on anaesthetics appears in the medical journals of the world. The struggle of reading and digesting them all is a never ending one. Gradually the eye gets used to picking out the striking headline or important summary for the numbed brain to store.

Now and then a paper excites one's interest. Perhaps it is because of the novelty of the subject or perhaps because the author states one's own half-unconscious ideas. Then comes the re-reading of the paper, the excitement of tracking down others on the same subject, the discussions with colleagues, and finally the formation and crystallization of one's own views for the time being.

In this way these essays were written. Many of them were put on paper only after long and often turbulent, but always enjoyable and fruitful, discussions with colleagues. It is in the hope that they will provoke equally valuable discussion among fellow anaesthetists and their pupils that I have been persuaded to publish them. Long experience with post-graduates has taught me that never is so much learnt by teacher as well as pupil as through the medium of discussion—the basis of the tutorial system already well known at Oxford and Cambridge.

I must record my very great debt to Professor R. R. Macintosh. In his company I learnt more about anaesthetics than I dare tell here. To have been a member of the Nuffield Department of Anaesthetics at Oxford, in which is established the only Chair of Anaesthetics in the British Empire, is a rare privilege, and I have a deep sense of gratitude to Lord Nuffield for his vision in establishing it, and to Professor Macintosh who has made it an anaesthetic centre of international repute.

The establishment of this Chair has had no little influence on the conditions under which the art and science of anaesthesia is carried on in this country. The practice of anaesthesia has for

long been restricted to medical practitioners. They are now given the dignity and privilege of being regarded as specialists in academic as well as in professional life. The wisdom of this course, carried out in the face of constant opposition, now more or less moribund but not yet dead, is apparent both from the notable advances in anaesthesia made in this country, by the high standard of anaesthetic work, and by the general ferment of inquiry evident in the ranks of the practitioners of this speciality. This is in happy contrast to the sad state of anaesthesia in many other parts of the world. Yet even in this country this branch of medicine was regarded only recently as hardly worthy of the attentions of a doctor.*

It must be the fervent hope of everybody interested in the academic future of anaesthesia, that other universities in this country will be equally far sighted and will emulate the University of Oxford and Lord Nuffield. Precedent and prestige are poor counsellors when they advise against an investment whose dividend is paid in terms of human lives.

I must thank Professor Macintosh, too, for his constant help in the writing of these essays, few of which are without the imprint of his ever-helpful and wise criticism. Many of them have appeared in one form or another in medical journals in this and other countries, and I am grateful to the editors for permission to reproduce a sentence here and a paragraph there from their journals. The references at the end of each essay are not meant to be complete, but to indicate where the reader might profitably meander in the literature if he is so stimulated.

I also thank Dr. Barbara Duncum, Ph.D., for her help with the essay on Hypnosis, and my Senior Assistant, Dr. L. Rendell-Baker, for his valuable criticism and help with proof-reading. My secretary, Miss W. R. Davies, devotedly gave me unstinted skill and help in the general preparation and typing of the manuscript.

CARDIFF, 1948.

* *Brit. Med. Journ.*, 1940, ii, 429.

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ANAESTHESIA FOR THE POOR RISK

THE POOR RISK PATIENT

EVERY anaesthetist is sooner or later confronted with a patient who is so ill that there is some anxiety as to whether he will survive the combined effect of operation and anaesthetic. In certain cases the operation is essential to save the patient's life. Every postponement means a step nearer to death. There can then, be no refusal by the anaesthetist to administer an anaesthetic.

In these cases the anaesthetist must not be tempted to pick on some infirmity of the patient as an excuse for putting off the operation. What will it avail a patient with acute intestinal obstruction if operation is delayed because he has a 'weak heart'? We must avoid trying to pin on to each operation or disease a particular anaesthetic as the best one for that occasion. The wisdom of teaching that cyclopropane is best for this, nitrous oxide for that, and ether for the other has yet to be demonstrated. Lives without number have been lost because the dictum 'X is the best anaesthetic for shock' was taken to heart by some one little experienced in its action. The next unfortunate shocked patient who fell into his hands paid a heavy price for his anaesthetist's well-meant adherence to what is pernicious teaching.

The anaesthetist (who after all bears the final responsibility), when more experienced, approaches such a patient not by asking, 'What anaesthetic should I give?' but, 'What can I do to safeguard my patient from sequelae peculiar to his illness?' An everyday example is the patient who has acute intestinal obstruction. Such a one must have his stomach intubated and emptied. The more ill he is, the more important intubation becomes. No ill-judged

consideration of pity should deter the anaesthetist from performing this manoeuvre, and with the biggest stomach tube that can be found, and while the patient is conscious too. If this is not done, faecal vomitus may be inhaled, with the inevitable arrival of the patient in the post-mortem room. Cases of this sort—by no means rare—throw into relief the relative futility of pre-operative discussions about the anaesthetic, which stress the particular drug to be administered.

Another common problem is the patient with respiratory obstruction who must be anaesthetized. Which particular general anaesthetic should be administered to such a patient is a purely academic question; all are likely to lead to an acute attack of mors. What the patient needs is relief of his respiratory obstruction before he is rendered unconscious.[1] Once this has been done, the choice of agent really becomes immaterial.

In general, patients who are gravely ill are easy to anaesthetize, and apart from special precautions, of which the above are examples, the well-recognized basic principles of safe anaesthesia still hold good—a good airway, adequate oxygen, and a level of anaesthesia which is not deeper than that required for the operation. What anaesthetic to select and how to administer it will largely depend on the experience of the anaesthetist. In this connection, 'Give what you are used to' is a good dictum.

At the moment there is little scientific evidence from the laboratory or from controlled clinical experiments to support the claim that any one general anaesthetic is the best. This applies equally to the fit or poor risk patient. Mitchiner[2] in a review of war surgery expressed this point of view in different words when he wrote:

> 'Many forms of anaesthesia are practised and advocated, and on the whole the majority are satisfactory in the experience of the surgeons for whom and of the patients to whom they are given.'

Realization of this simple fact must be borne in mind by physicians, surgeons, and anaesthetists alike.

The amount of anaesthetic and the care with which it is given overshadow other considerations. Ether carefully given, to a depth commensurate with the operation, may well be preferable to an attempt to be 'modern' both in agent and machinery. To paraphrase Marie Lloyd, let the watchword of anaesthesia for the poor risk be, 'A little of what I know won't do any harm'. As his experience of handling shocked patients increases, the anaesthetist becomes more competent and versatile in his choice of methods. Then, like experts in other fields, he is able to employ refinements of his art which are dangerous for the novice to attempt.

Despite the emphatic teaching of surgeons and anaesthetists[3] [4] experienced with spinal analgesia, the use of this method for the poor risk patient is a pitfall into which the unwary still tread. It is not uncommon to hear of spinal anaesthetics being given to patients with a grave abdominal emergency, the anaesthetist perhaps adding with pride, 'and I got away with it'. Such an achievement deserves only censure.

The most gratifying results from spinal analgesia, whatever the drug or technique, are obtained in the 'good risk' subject. Those who use spinal analgesia in the gravely ill will, without doubt, obtain excellent operating conditions, but their patients will give them less anxiety and will die less often if some other form of anaesthesia is used. To the doubters—and they can only be among those whose experience of spinal analgesia in grave illness has been limited—I will quote two recent opinions from dozens in the literature. Gordon-Taylor[3] says of anaesthesia for the abdominal injuries of warfare, 'Only a lunatic would employ spinal anaesthesia'. Hewer[5] in *War Wounds and Injuries* says, 'If a shocked patient must be anaesthetized . . . toxic drugs . . . should be avoided . . . and so should spinal anaesthesia'. The alternative to spinal analgesia in the ill patient is not necessarily inhalation anaesthesia, but may well be some other form of regional block.

The post-operative period, too, is a time when much can be done to help the poor risk patient. Oxygen therapy can do

nothing but good during this period when tissue anoxia may be a prime event. As a last resort for the dying, oxygen therapy is a familiar sight. As a valuable therapeutic agent for the living it is still too rarely used. Both doctors and the laity should, by familiarity, come to regard oxygen not with the sinking feeling that death is imminent, but rather with optimism; that though decanted as a gas from a cylinder instead of a liquid from a medicine bottle, the patient is receiving the very essential necessity of life.

Pulmonary complications remain the bugbear of abdominal surgery, and a 'chest' in a poor risk patient may well mean the difference between survival and death. Of proved value are sulphonamides, penicillin, breathing exercises, and tracheo-bronchial suction. Nevertheless, prevention is better than cure, and it is not unreasonable to suppose, as has been suggested, [6 7] that these complications are prevented if full respiratory movements, such as are ensured by the patient in a Both Respirator, are maintained for the immediate post-operative period. The method has been tried successfully and deserves further trial. Public and professional reaction to the 'iron lung' as a rather horrific contraption should not hamper or delay investigation of anything which holds promise of reducing post-operative respiratory complications.

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CONVULSIONS DURING ANAESTHESIA

THERE are nearly as many theories of the cause of convulsions during anaesthesia as papers on the subject. It was the custom for years for each writer to construct a plausible hypothesis based on his own few cases, usually implying that anaesthetic convulsions represent a finite entity, connected with one or other of the anaesthetics. A number of apparently correct though different answers to the same question usually means, not that they are all wrong, but that they are all right. Integration is then the need. This has been supplied, in the case of convulsions, by Pask[1] who, after a careful analysis of the available evidence, has helped to pull the theories together by urging the non-specific nature of these convulsions. Ether convulsions as such were not being reported until 1927,[2] but case histories published long before that time described what we can now recognize as the same thing.

The many factors concerned in the causation of the convulsion may be divided into two orderly groups. First there are the predisposing conditions, such as youth, infection, and pyrexia, and then there are the immediate stimuli, the 'triggers' which let off the convulsions in suitable circumstances. These include carbon dioxide excess, lack of oxygen, overheating, and respiratory obstruction. It is probable that an immediate stimulus is essential to lead to a convulsion; the predisposing condition alone is not enough. Electro-convulsion therapy has, in addition, made it clear that the threshold stimulus for convulsion varies widely. Pask gives the advice not to ask, 'What is the cause of anaesthetic convulsions?' but rather, 'What combination of factors had led to this disorder which manifests itself by convulsions in this particular patient?' The anaesthetist must be cautious in assessing the effectiveness of any one form of treatment, since no treatment is likely to be specific when the causes are multiple.

When convulsions do begin during an anaesthetic the aim

must be to remove as many causative factors as possible. Such steps as temporarily stopping the operation and the anaesthetic, and giving oxygen through a perfect airway, are obviously desirable, but time should not be lost in trying the numerous other suggested manoeuvres as widely at variance as sitting the patient upright, and an expedient of a century earlier, hanging him up by his feet.

These convulsions are attended by a high mortality, but this can be much reduced if the convulsions are controlled with small doses of barbiturates intravenously. This is one of the rare complications of anaesthesia, but it is serious enough to justify preventive measures when predisposing conditions are present; these measures will include pre-operative barbiturate medication or a barbiturate induction of anaesthesia, the avoidance of overheating and prolonged head-down positions, and an anaesthetic technique which ensures a free airway and an abundant supply of oxygen.

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HAEMORRHAGE AND ANAESTHETIC DOSAGE

DURING the war, in battle-area tents and in civilian hospitals with bombs exploding nearby, anaesthetists learnt, perhaps with some wastage of life, that a shocked person requires strikingly small amounts of anaesthetic to produce adequate anaesthesia. 'A little goes a long way' was a phrase soon coined in this connection.

Anaesthesia may be considered as a state midway between life and death. The nearer the patient is to death by reason of his injuries, the less extra injury in the shape of anaesthesia is required to complete the process and kill him altogether. Yet both in England during the 'blitz', and after Pearl Harbour, it was claimed that in shocked subjects danger lay in one anaesthetic while another conferred immunity against fatality, as though the pharmacological effects of anaesthetic drugs altered fundamentally when they were given to a shocked patient. Doses were advised as though these were standard for all patients and conditions.

The necessity of correlating the dose of anaesthetic to the state of depression of the patient did not appear to be generally appreciated before this war. There were many anaesthetists on whom Guedel's[1] message failed to make any deep impression. It is that the dose of anaesthetic to produce a desired effect is governed by the state of metabolic activity of the patient. Now after years of war in which the effect of a variety of anaesthetics has been observed on shocked patients, the true value of drugs of such different composition and vintage as pentothal and ether is being realized. We know that both can be given safely to the shocked person provided they are given with due regard to the degree of depression of the patient and only in sufficient quantity to produce the requisite effect.

Experimental evidence has been produced to support these clinical observations. Wood and Jaco[2] determined the doses of

pentobarbitone and of ether to produce anaesthesia of an arbitrary depth in animals recently bled. When a blood loss of 20 c.c./kg. had been sustained the dose of intravenous pentobarbitone was reduced by 18 per cent. A significant observation was that the safety ratio, or the ratio of the dose producing anaesthesia to the dose which resulted in respiratory failure, was not altered in these animals. With ether, a loss of more than 25 per cent of blood volume reduced the induction time to between 60 per cent and 75 per cent of the normal, and anaesthesia was achieved with much lower concentrations than in the normal animal.

The results of these experiments must be well considered by those who have to anaesthetize the shocked. Too much attention has been focused on the choice of a particular agent and too little on the avoidance of overdosage. The hazards to the shocked patient from anaesthesia come from such things as unnecessarily deep anaesthesia, itself a state of shock, excessive and badly-timed pre-operative sedatives, anoxia due to the misuse of nitrous oxide, and from neglect of such fundamental principles of anaesthesia as the maintenance of a clear airway and the administration of abundant oxygen. A long recovery time, itself undesirable, results from a combination of several of these factors.

Recent controversies on what constitutes 'modern anaesthesia' suggest that there is still much to be learnt, and not only by recruits to the ranks of anaesthetists. The shocked patient is best served by his anaesthetist concentrating his efforts on maintaining a perfect airway and adequate oxygenation, and on keeping the level of anaesthesia as light as possible compatible with the surgeon's requirements. These constitute the true criteria of modernity and of good anaesthetic work and should not be obscured by emphasis on apparatus; moreover, the use of drugs and methods which make these criteria uncertain of realization by the inexpert are not in the direction of the best interest of the patient.

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ANAESTHESIA FOR THORACOPLASTY

ANAESTHESIA for thoracoplasty is a bone of contention among those who gather round the tubercular patient. This topic was discussed at a joint meeting held in 1946 between the Tuberculosis Association and the Section of Anaesthetics of the Royal Society of Medicine, and again in 1948 at the Annual Meeting of the British Medical Association. The papers and subsequent discussion at these meetings revealed what was already known—that among both surgeons and anaesthetists there is still considerable variance of opinion as to which anaesthetic is the best for this operation.

Both the enthusiasts of local and the advocates of general anaesthesia included surgeons and anaesthetists of long experience of the operation. In favour of local anaesthesia is cited the low toxicity of the anaesthetic, although whether this is true of the large amounts commonly used is open to doubt. Also brought forward is the retention of the cough reflex by the patient and the absence of the explosion risk. Against this, much is made of the mental trauma suffered by the patient—a trauma of no mean degree unless large doses of sedatives, virtually a general anaesthetic—are used. In addition, the technique of local anaesthesia takes time and no little skill. The intercostal nerves must be blocked, as well as the brachial plexus, while some operators block the cervical plexus and even vagi. A very extensive infiltration looks after the incision and scapular retraction. All this adds up to a local anaesthetic which is no mean anatomical exercise.

General anaesthesia is less spectacular than local, but it provides the surgeon with a patient who is immobile and has no memory of what is otherwise at best an uncomfortable experience. Paradoxical breathing can be controlled when necessary,