

repaired. I am thankful to say the wounds healed well and show little scarring, though we hope when he is older that the plastic surgeon may be able to disguise those scars which he still has. Incidentally, this was the first time that this nurse had used trilene in earnest, and it says a great deal for her presence of mind that she was able to cope so well.

I have not told you very much about the management of accidents; I have instead stressed their avoidance, since I feel sure that you will all agree that it is on the prevention rather than on the treatment of accidents that we must concentrate.

ANAESTHESIA AND ANALGESIA

D. Bigley, M.R.C.S., L.R.C.P., F.F.A.R.C.S.

(Anaesthetist, Birmingham Accident Hospital)

Great advances have been made in anaesthesia, and this is very much seen in the work of accident hospitals today. It is greatly due to the foresight of your chairman that anaesthesia has been introduced as an integral part of the teamwork in treating casualties in this region.

This is not the time to go into details of anaesthetic techniques, as one would in teaching students. Many people here today know how to give anaesthetics and many are experts in their particular requirements for practice or hospital work. Dr Fergusson said that I might be dismayed to hear that chloroform was carried in his emergency bags, but the only thing which would dismay me would be having to use it, because I am no expert with chloroform, though many people are. As I shall mention later, it is not so much what you use in anaesthesia as how you use it.

In the accident hospital where I work the anaesthetist is a member of each of the teams into which the hospital staff is divided. The anaesthetist may well be amongst the first one or two people seeing a major injury, and he and the surgeons work absolutely together in deciding what is to happen to the patient in the way of surgery and resuscitation. To understand the position of anaesthetists inside hospitals and in general practice, it is important to realize how anaesthetics have developed over the past twenty years, not from the point of view of techniques, drugs, or apparatus, but from the point of view of what the student or the newly qualified practitioner today knows of anaesthetics and what he does not know. So frequently today either the newly qualified person does not know how to give an anaesthetic, or if he does he wants a Boyle's machine to be brought up the mountainside for him, as Dr Fergusson said.

Earlier than twenty years ago, before the war, the medical student learned a certain amount for a month or 6 weeks about anaesthetics, and he very probably learned either the open method with Schimmelbusch's mask and some chloroform, ethyl chloride or ether, or on a very simple apparatus such as the early forms of Boyle's machine. When he qualified he would find, usually slightly to his distress and embarrassment, that as a resident in a hospital he was also one of the resident anaesthetists. I remember when I was resident anaesthetist, one of my methods of getting an evening off was to go through some rather aged hospital papers to find out who officially was my stand-in, because I was the only resident anaesthetist. I discovered that the second duty house physician was resident anaesthetist in my absence. Wanting to avail myself of this on one occasion I searched out this unfortunate and asked him if he would stand in for me, which he very kindly did. On my return I found a message asking me to go to the main theatre as soon as possible. I went, to find the second duty physician with a patient on the table and a very large bag beside him; the look of relief on his face, and the speed with which he left the theatre, assured me that I was welcome. However, that is the way people did at one time get some experience, even though they were not doing anaesthetics, of the practical difficulties of the subject.

In the last ten or fifteen years things have greatly changed. Hospitals are staffed with anaesthetists. If the resident anaesthetist wishes to go out for the evening now, there is a second resident anaesthetist, sometimes even a third and fourth who will take his place for the emergency work. Similarly, changes have taken place in the training of students. The student today may not use a simple method at all. In his month's tuition, he may sit with the consultant anaesthetist or registrar anaesthetist beside some glittering machine, the patient quietly breathing away through an endotracheal tube which has been put in by the anaesthetic expert, and it appears that most of the work consists of turning little knobs and an occasional injection of something new and strange. This is no way to turn out anaesthetists for work such as occurs in the north of Scotland, or for that matter in any practitioner's surgery. I wish that I could answer Dr Fergusson's request for a simple anaesthetic which all can give, but there is none. There is no really simple general anaesthetic for the person who is not an anaesthetist. This does not mean that there is anything particularly good about anaesthetists, or that there is anything particularly difficult about giving an anaesthetic. That is certainly not true, but to combine absolute safety, simplicity, and portability, all in one little bottle is impossible.

However, you should use only what you know how to use. It is

terribly easy to hear that such and such a firm has produced a new machine, a new drug, a new technique, and to think, " Oh, well, we will go and use that one; it must be very good. It is easy, safe, simple, and all comes out of one little bottle ". This unfortunately has not yet been attained. The profoundly practical importance of maintaining a clear airway in any patient is still fundamental, and until you are absolutely certain how to do this you are jeopardizing the patient's safety whenever you put him to sleep. So long as you have that in mind, and know the few simple little rules for keeping a clear airway, you are half-way there. One must also know what the particular drug can do; great danger lies in the simplicity of introducing dangerous drugs into the patient, especially by the intravenous route. Once one has the needle in the vein, a feeling of satisfaction and enthusiasm comes over one, and it is so easy to press on with a little more and give an overdose. A certain amount of training and a very real sense of responsibility are needed before embarking upon such a method. The use of inhalation anaesthetics such as chloroform, ethyl chloride, ether, or trilene in the hands of those who have had training in them as students or as secondary anaesthetists when housemep is good and much safer. If I had to put my money on a single drug then I think ether would be the one.

There is today also a very simple little apparatus which will get one out of many a worrying little corner. It consists of nothing more than a little bellows, which looks very much like a concertina. It can be attached to simple face-piece and a patient's lungs may be inflated if for some reason or another he has ceased to breathe spontaneously. It is a cheap little thing, quite foolproof, and I think anyone who gives an anaesthetic of whatever sort, would feel much more comfortable if he had one at hand.

This problem of what to give as an occasional anaesthetist is a matter of personal knowledge of what you can or cannot give. I brought that home at the beginning by saying I would be unhappy if I had to use chloroform because I just missed the chloroform era, but I did come into the era of ethyl chloride which some people tell me is even more dangerous. I happily use the one but I would be scared to use the other.

I wholly agree that a great deal of misery and discomfort can be inflicted on patients by subjecting them to a series of assaults with a needle with the idea of rendering an injury painless, but the scope of a local analgesic is sometimes underestimated.

There is almost literally no operation that cannot be done under local anaesthesia if it is tackled properly, and with knowledge and training. It is simple; you need your drug, a syringe, and two or three needles. A great danger of local analgesia is that overdosage

can occur, and a number of people are worried, because they have heard of cocaine sensitivity and of convulsions following the use of local anaesthetics. These things do in fact occur. But why? It is not due to a particular sensitivity of the patient to very small quantities of these drugs, but to the wrong usage of drugs. Either they are introduced into the general circulation by inadvertent intravenous injection, or they are given in too great total dosage. All the anaesthetic drugs today used in local analgesia have a definite top dosage; no one would express surprise on hearing that a patient given a grain of morphine was unwell or even collapsed, because it is so well known that the dose is up to a third of a grain. But it is not so commonly realized that for procaine, for lignocaine, for cocaine and all the others there is also a top safe dosage. One can calculate quite easily from the strength of the solution used how much of it you can use. It is usually safe with weaker solutions to use something in the region of 50 to 100 ml. of one per cent solution, which is a perfectly adequate amount for the great majority of operations one would tackle. It can give one a tremendous feeling of safety and comfort to realize that the quantity in your syringe or in your bottle is within the safe dosage. Only by knowing the dosage and knowing that you are below the top dosage in this particular case, can you really be sure that you will not encounter these disasters.

There is also the question of choice of patient. Dr Fergusson very rightly drew attention to the crying child. It is not, I am sure, a great deal of avail trying to comfort a crying six-year-old who is in pain by inflicting further pain with a needle. The patient must be selected, and you must all encounter in your surgeries every day people who would not be suitable for a minor operation under local anaesthesia. On the other hand, the great majority of people, once told just what is going to happen, are quite happy to have the small procedure performed under this method of analgesia. One important thing is not to tell the patient that he will feel nothing, but to tell him he will definitely feel something, but it will not be pain. One does certainly feel something even under a regional nerve block such as a spinal anaesthetic or a brachial plexus block or any of those large procedures which incidentally I do not necessarily recommend for smaller work. Even with those you do know something is going on, but it is not painful, it is just touch and movement. Properly persuaded by such an explanation most people will be quite happy under local analgesia. Also if one is trying to block a nerve, or going to infiltrate an area, an adequate quantity of the analgesic drug must be put in. So long as the dose is below the maximum, it does not matter how much is given, there is no great merit using 5 ml. of drug if the dosage scale will allow you to use

100 ml. The time allowed for the drug to work is also important. I dare say that there are some present today who have been given a local analgesic and had the operation started almost immediately. A little time given for the drug to work and get a real good hold on the nerve is very important. If you start within a minute of the injection, you destroy all the patient's confidence if he really feels a little pain even though it is going to go off in a minute or two; much better to wait five or six minutes and let it really work. This is simple advice but sometimes the point is missed. The great majority of the nerve blocks are very simple; even blocking the brachial plexus can be learned quite simply. There are little rules to follow and with a little practice one becomes quite adept at it; finger blocks, toe blocks, and blocks at the ankle and wrist are again almost too simple to discuss technically. Infiltration of such fractures as a Colles' fracture may be most useful for the general practitioner who has to work singlehanded, particularly in elderly patients, in whom this fracture is so very common.

I would like to conclude with one or two small points about general preparation of the injured patient whom one may see at the roadside, in the surgery, or anywhere outside a hospital, the injured patient who is going into hospital and may well have an anaesthetic in the very near future. The main killing factor in anaesthetics today is vomiting, and probably the very first thing to ask the patient as he gets into the hands of the surgeon and anaesthetist in hospital is "When did you last have something to eat or drink?" This is so well known that I should apologize for mentioning it, but with vomiting, the leading killing factor in anaesthetics, I do not think one can be too frequently reminded of the importance of, if possible, having a patient with an empty stomach. With surgery today, certainly in the hospital manned day and night by surgeons and anaesthetists, it may be desirable or in some cases even life-saving, to have an operation performed inside an hour of getting to the hospital. If the patient has stomach contents, with all the anaesthetic skill in the world there may well be risks which the patient can ill afford to run, so that the patient should be prevented from taking anything by the mouth following an accident.

Pain-relieving drugs, such as morphine or pethidine, are commonly given at the roadside or in the pit by the well-meaning, but sometimes can lead to great danger to the patient. I will tell a little story about this which is perfectly true. I was asked on one occasion to go to the theatre to assist a junior anaesthetist who was having trouble with the respiration of a patient. When I arrived in the theatre this was indeed true. The patient was breathing very poorly indeed and it was difficult to find any reason for this but on going through

notes, scraps of paper, and questioning other people it was eventually found that that patient had been given on no less than three occasions an adequate dose of pethidine between having the accident and arriving in the theatre. It was extremely difficult to find out just when and where, and it was not until it was all over that we discovered that it had been given subcutaneously. In a shocked patient a subcutaneous injection just lies there without being absorbed into the general circulation perhaps for an hour or two. When this patient was put to sleep in the theatre a little circulation began again and picked up the three little doses of pethidine and of course his respiration was greatly depressed. No harm came of it, but it is a lesson. The use of pain-relieving drugs is rather wasted if one has to wait hours for them to be picked up by the general circulation in the shocked patient. Intravenously they will work inside about a minute, so I would suggest that on some of these occasions intravenous morphine or pethidine be given where it is necessary to relieve pain. An immediate and adequate record should be made somewhere in the patient's notes, or even on the patient, so that there is no doubt what the patient has already received.

Where the patient is very elderly, the dosage should be adjusted accordingly. I have seen patients of over 90 come into hospital and shortly after arriving drop off into a remarkably profound and lengthy sleep, because they had had the dosage of morphine or omnopon suitable for a young athlete. At 90, the dosage is very much less than for the fit young man. One other point concerns posture. If a patient is unconscious and injured and is being sent into hospital, to send him in lying on his back is unwise, to say the least of it. More than once I have seen death from vomiting with the patient lying on his back. Patients with injuries of the head, face, mouth and nose, should all be put in the lateral or semi-prone position, sometimes called the tonsil position; many a tragedy will be avoided by such a simple little point.

DISCUSSION

T. G. Lowden, F.R.C.S. (*Casualty Surgeon, Sunderland Group Hospitals*): I propose to discuss the treatment of minor injuries, and not minor injuries that look like major injuries. I think we should talk, for instance, about cut fingers. If a patient comes to you with a cut finger, do you sew it up? If you sew it, how do you sew it? Do you sew up a cut on the back of his finger and on the front of