High Blood Levels of Methoxyflurane

To the Editor:—The recent case report of Dr. Lowe *et al.* (ANESTHESIOLOGY 30: 471, 1969) concerning cardiovascular stability in the presence of unusually high levels of halothane prompts me to record a similar case of unusual cardiovascular stability in the face of very high blood levels of methoxyflurane.

The patient, a 66-year-old, 200-pound man scheduled for osteotomy of the tibia, underwent induction with 325 mg thiopental. Intubation was facilitated by succinylcholine and anesthesia maintained with oxygen and methoxyflurane, vaporized in a No. 8 Heidbrink vaporizer. Monitoring was carried out with both an ECG and an EEG.

Blood pressure on admission was 130/80 mm Hg. Immediately prior to induction it was 160/80 mm Hg, with a pulse rate of 80. After intubation pressure rose to 200/120 mm Hg for a few moments. Thirty minutes after induction it fell to 110/70 mm Hg. At this time the EEG showed burst suppression of 2–6 sec duration interspersed with low-voltage activity of ½-sec duration. This fall in BP lasted only a few minutes after withdrawal of the methoxyflurane. Apart from these two episodes, the BP varied between 140 and 180 mm Hg systolic during the anesthesia, which lasted an hour and 30 minutes. The pulse rate was 80/minute throughout, and no arrhythmias were observed. Arterial blood samples withdrawn during the operation and estimated for methoxyflurane later showed a high of 53 mg/100 ml at the time of burst suppression and levels between 7.4 and 46.5 mg/100 ml. thereafter. P_{CO_2} values varied between 20 and 30 mm Hg.

After the appearance of burst suppression, methoxyflurane was administered only intermittently for short periods for the rest of the operation. Recovery was not unduly prolonged and the patient was discharged from the recovery room an hour and 30 minutes after the end of anesthesia.

This patient was one of a group of ten anesthetized by this technique. As previously reported (Wolfson, B., *et al.*, ANESTHESIOLOGY 28: 1003, 1967), in four of these patients persistent hypotension supervened before the onset of burst suppression in the EEG. The highest blood level seen in the other patients was 37.0 mg. The present reported level of 53 mg/100 ml with only a very short-lived and modest hypotensive episode suggests an unusually high degree of tolerance for methoxyflurane. It is of some interest that this blood level is equivalent to approximately four times the MAC for this agent.

BERNARD WOLFSON, M.B.
Department of Anesthesiology
Mercy Hospital
1400 Locust St.
Pittsburgh, Pennsylvania 15219

Another Close Call with "Crossed Valves"

To the Editor:—The following account clearly illustrates a hazard which has cried out for an engineering solution for a long time. How long must we wait for this?

Two months ago a resident anesthesiologist set up the anesthesia apparatus for an open-heart operation in a cardiothoracic operating room. The attending anesthesiologist also checked the breathing circuit and found it airtight.

When the surgical team had completed the cutdowns under local anesthesia, the resident induced anesthesia with thiopental and succinylcholine. He attempted to inflate the patient's lungs with oxygen before intubation but found he could not do so. The attending anesthesiologist found that the breathing bag would not inflate, checked the circuit, detached the breathing tubing and found that although the bag could be filled, he still could not inflate the patient's lungs. The trachea was intubated rapidly and the patient given mouth-to-tube artificial respiration while another machine was brought in. Anesthesia

Downloaded from http://asa2.silverchair.com/anesthesiology/article-pdf/31/2/194/288485/0000542-196908000-00017.pdf by guest on 09 April 2024

then proceeded uneventfully with this new machine.

A technician checked the original gas machine and after stripping down the breathing circuit reported that it was working satisfactorily and that he was unable to determine the cause of the trouble. There had been difficulty with the canister on–off switch, which had jammed, and it was thought that maybe this was in some way responsible for the difficulty experienced.

Two months later an attending anesthesiologist went to prepare the same gas machine in the same OR for an open-heart operation. He attached the sterilized corrugated tubing, Y-piece, and breathing bag to the machine. On inflating the breathing bag with oxygen, he was surprised to see that it did not deflate, but instead remained full. Aware that there had been trouble with this machine before, he checked the absorber, but still could not understand what was wrong. It wasn't until the C.R.N.A., who has charge of the equipment, arrived on the scene, that the correct diagnosis was made—*two sets of valves*, one on the canister, the other in the Y-piece, but *in opposition*. By then the build-up in gas pressure had forced one of the valves in the Y-piece off its seating.

Enquiries disclosed that the supervisor of the cardiothoracic OR recently had ordered a number of new metal swivel Y's (Anesthesia Associates) and in error specified they be fitted with valves. All the other 24 gas machines are fitted with metal swivel Y's, but without valves because the absorbers contain valves.

We were lucky that in each case two anesthesiologists and a spare machine were available to solve the immediate difficulty. However, it must be clear that under less fortunate circumstances a tragedy could easily have occurred. It is also clear that this simple error is NOT easy to detect in the heat of the moment unless one has it in mind when trouble occurs. Surely it is worth some temporary inconvenience to eliminate this hazard for all time by a simple mechanical change in design.

LESLIE RENDELL-BAKER, M.D.
Director, Department of Anesthesiology
Mount Sinai Hospital
New York New York 10029

Brachial Plexus Block

To the Editor:—It was with a great pleasure that I read the report of DeKrey, Schroeder, and Buechel on continuous brachial plexus block in the March issue of ANESTHESIOLOGY.[1] Although they cite Ansbro,[2] who described a technique of continuous supraclavicular brachial block using a metal needle in 1946, they were apparently unaware of our description in 1964[3] of the use of plastic needles to provide both continuous axillary and continuous subclavian perivascular block. Nonetheless, with regard to their technique of continuous brachial plexus block, it is imperative to point out that once a paresthesia has been obtained, an initial injection of anesthetic solution should be made, not only to ascertain that the needle is in the sheath, but also to expand the sheath and push the nerve trunk away from the needle. Following this, the needle should not be advanced (or at *most* only for a distance of 1 mm) but should be held firmly in place while the catheter is advanced over it; the catheters currently available are rigid enough to advance along the sheath. This minor detail is important if one is to avoid either lacerating a nerve with the needle or making an intraneural injection.

Since development of the interscalene technique,[4] we have preferred continuous brachial plexus block by this approach, for should the plastic catheter advance when the patient turns his head or moves his neck, there are no vital structures at *this* level that can be damaged. Our primary indication for continuous brachial block has not been simply for prolonged operation, but more often for severe trauma to the extremity, particularly with vascular damage, where continuous sympathetic block, as well as sensory and motor block, is desirable for prolonged periods.

Downloaded from http://asa2.silverchair.com/anesthesiology/article-pdf/31/2/194/288485/0000542-196908000-00017.pdf by guest on 09 April 2024