

Correspondence

An Unusual Hazard of Methoxyflurane

To the Editor:—During induction of anesthesia with nitrous oxide, 3 l/min, and oxygen, 2 l/min, we turned on 200 ml/min of oxygen to vaporize methoxyflurane in a top-filling 400-ml Copper Kettle. This mixture of anesthetic gases was delivered to the breathing circle through a clear plastic tube. Within seconds after turning on the methoxyflurane, this plastic tube began to fill with a foamy, brownish fluid. Immediately the patient was disconnected from the machine. Since he had not inhaled any liquid, he made an uneventful recovery.

On examination, we found that the methoxyflurane had foamed in the Copper Kettle, filling the kettle and spilling foamy liquid into the delivery tube every time the oxygen feeding the vaporizer was turned on. In the connecting tube, some of the foam settled as liquid. Methoxyflurane from this Copper Kettle also foamed when shaken in a test tube. Fresh methoxyflurane does not foam. We were able to demonstrate that a speck of sealant that had been applied to the gasket of the lid by a professional maintenance man was responsible for turning the methoxyflurane into a foaming substance. A quick test in our laboratory showed that as little as 0.004 mg of Dow-Corning #11 sealant in 100 gm methoxyflurane is enough to change the physical characteristics of the anesthetic: it will now foam when agitated. We estimate that ap-

proximately 1 mg of contaminant, which is about the size of a large match-head, is more than enough to raise foam in an oxygenated Copper Kettle and consequently deliver foamy and liquid methoxyflurane to the breathing system.

We tested seven anesthetics with Dow-Corning #11: chloroform, trichloroethylene (Trilene), diethyl ether, halothane (Fluothane), fluroxene (Fluoromar), methoxyflurane (Penthane), and enflurane (Ethrane). On shaking, foam formed only with methoxyflurane, trichloroethylene and chloroform. Methoxyflurane developed by far the most persistent foam.

We have been unable to find any references to foam formation by anesthetics contaminated with silicone compounds.

Even though the sealant had been used in our machines for at least ten years, to our knowledge this potentially lethal event has happened only once. We are now including two additional safeguards: Omit all sealants in Copper Kettles and routinely check the window in a Copper Kettle to make sure that no foam is forming.

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