Serious Defects in "Simple" Equipment

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This communication directs attention to a hazardous mechanical anomaly recently found in anesthesia equipment and to emphasize that (1) the anesthetist must routinely and meticulously test the function of all anesthesia equipment immediately prior to use and (2) the manufacturer should be promptly and fully informed of any defect of construction or function of this equipment.

CASE REPORT

A 35 year old post-partum patient with severe pneumonia was placed on an Emerson ventilator postoperatively because of a fall in P_{O_2} (30–40) and extreme fatigue. She improved on the ventilator for 18 hours. Serial blood gas determinations revealed a P_{O_2} of 92 on an inspired P_{O_2} of 500 and a falling P_{CO_2} with the last reading of 30. The dropping P_{CO_2} with borderline P_{O_2} prompted the decision to add dead space rather than to decrease ventilation volume to bring the P_{CO_2} towards a more normal range. A new 12 inch infant breathing tube was visually checked and then inserted between the Y piece of the ventilation inspiratory and expiratory line and the tracheostomy adaptor. After the tube was inserted and the patient reconnected to the ventilator, it immediately became evident that no ventilation was occurring. The patient was disconnected from the ventilator, and ventilation was accomplished readily with a breathing bag. It was noticed that no air was flowing through the infant breathing tube as the ventilator cycled. A probe was inserted into the tube, and an obstruction was encountered on the inside end of the bushing. The tube was cut lengthwise to reveal that what should have been the lumen of the bushing was completely occluded by a rubber diaphragm. Figure 1 shows the bi-valved bushing and tube with the rubber diaphragm which completely occluded the orifice of the tube.

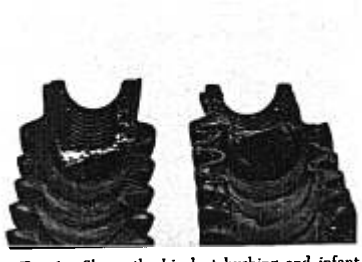

FIG. 1. Shows the bivalent bushing and infant breathing tube. The cut edge of the occluding rubber diaphragm has been touched up with white paint.

DISCUSSION

It is obvious from the described experience that no piece of anesthesia equipment is so simple or reliable that it cannot be defective and potentially life threatening. Even though the tube in question had been checked visually, it had not been checked functually. When the manufacturers were informed of the incident, they immediately inspected all their tubes of similar lot number and found this one to be the only defective tube. However, as a result of this case they are changing the inspection procedure so as to avoid the human element. As bushings are installed in the tubings, the fixture will have a male prong which is to pass through the bushing; otherwise, it cannot be installed.

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