

heart, and then to the groundplate. Spontaneous remission probably was due to the already functioning pacemaker. Fibrillation was diagnosed by direct observation of the heart; the electrical noise caused by the cautery rendered cardioscope monitoring ineffectual.

When the heart is not exposed and cautery is used, continuous monitoring of heart sounds or pulse is the only practical means of detecting ventricular fibrillation or other arrhythmias instantly. The anesthesiologist needs to be alert to the fact that electronic devices, although used daily with apparent safety, may cause arrhythmias in certain situations.

REFERENCES

1. Weinberg, D. I., Artley, J. L., Whalen, R. E., and McIntosh, H. D.: Electric shock hazards in cardiac catheterization, *Circ. Res.* 11: 1004, 1962.
2. Whalen, R. E., and Starmer, C. F.: Electric shock hazards in clinical cardiology, *Mod. Conc. Cardiov. Dis.* 36: 7, 1967.
3. Noordijk, J. A., Oey, F. T., and Tebra, W.: Myocardial electrodes and the danger of ventricular fibrillation, *Lancet* 1: 975, 1961.
4. Burchell, H. B.: Hidden hazards of cardiac pacemakers (editorial), *Circulation* 24: 161, 1961.
5. Fein, R. L.: Transurethral electrocautery procedures in patients with cardiac pacemakers, *J.A.M.A.* 202: 101, 1967.

Extreme Obesity

GERALD EDELIST, M.D.*

The management of the extremely obese patient requires, among other considerations, meticulous measures to prevent atelectasis and pneumonia postoperatively. Experience has shown that the obese patient is particularly prone to develop this complication, with characteristically disastrous consequences.^{1,2} A rational and successful management of one such case is reported.

CASE REPORT

The patient was a 27-year-old, mentally retarded, 275-pound 4 foot, 7 inch woman (fig. 1) with a history of an endocrinopathy which, despite complete endocrine work-up, was undiagnosed. She also had cholecystitis and cholelithiasis. She was presented to us, as an outpatient, by our surgical colleagues as a candidate for cholecystectomy on an elective basis. Despite vigorous attempts with diet, no weight loss could be accomplished. The patient was admitted to the hospital three days prior to surgery and was educated (with some difficulty because of her mental retardation) in the use of the Bennett ventilator. She was informed at this time that when she awoke after operation the trachea would be intubated and a ventilator would be helping her to breathe. On the morning of surgery, 5 cc. of 2 per cent xylocaine was nebulized via the respirator, to anesthetize the pharynx and larynx. Five per cent cocaine was used topically in one nostril, and a No. 32 French nasotracheal tube was passed blind nasally without difficulty. Anesthesia was

then induced with a sleep dose of thiopental and maintained with halothane-oxygen with *d*-tubocurarine in dosage sufficient to produce complete muscular paralysis and optimum surgical conditions. The operation was completed in one and one-half hours, and the patient returned to the recovery room with the nasotracheal tube in place, being ventilated with an Ambu bag. She was maintained on the Bennett ventilator, without reversal of *d*-tubocurarine (which we usually carry out in patients who have received *d*-tubocurarine) and ventilated with great care to use large tidal volumes and repeated sighs until she was wide awake and alert. The nasotracheal tube was left in place and the patient hyperventilated every half hour for the first 48 hours post-surgery. The tube was then removed and the patient given a session on the ventilator via mouthpiece every hour for the next two days. Recovery was completely uneventful, with no pulmonary or other complications.

COMMENT

The management of the obese patient has been discussed in many reports and the techniques recommended have varied from spinal anesthesia (continuous) to all of the various forms of general anesthesia.^{1,2,3} We felt we would prefer a technique which would assure: (1) the least possibility of airway obstruction; (2) complete paralysis, to expedite surgery; (3) ability to provide adequate oxygen concentrations during and after anesthesia; (4) that residual paralysis from the muscle relaxant would not pose a problem; (5) the ability to give large tidal volumes and periodic sighs to

*Assistant Professor of Anesthesiology, Albert Einstein College of Medicine, New York, N. Y.

prevent "miliary atelectasis" until the incisional pain had been minimized and the patient could take large breaths spontaneously; (6) the opportunity to allay the patient's pain with adequate narcotics and still be certain of adequate ventilation.

One possible disadvantage of the technique we used is the prolonged tracheal intubation. This, however, has been shown to be relatively safe in the patient with a normal larynx,⁴ provided high humidity is maintained in the airway.

The decision to avoid spinal anesthesia was made because of the following potential disadvantages: (1) difficulty in performing the lumbar puncture; (2) difficulty in predicting the level of anesthesia; (3) markedly obese patients have been shown to have low compliance, high airway resistance and the tendency to hypoventilate^{5,6} (it is this type of patient who should have respiratory assistance during anesthesia, and this is not easily accomplished during spinal anesthesia); (4) in the immediate postoperative period, the ability to initiate an effective cough might be compromised due to residual abdominal muscular relaxation, leading to atelectasis and pneumonia.

REFERENCES

1. Catenacci, A. J., Anderson, J. O., and Boersma, D.: Anesthetic hazards of obesity, *J.A.M.A.* 175: 657, 1961.
2. Gould, A. B., Jr.: Effect of obesity on respiratory complications following general anesthesia, *Anesth. Analg.* 41: 547, 1963.
3. Jacobs, L. J., Berger, H. C., and Fierro, F. E.:



FIG. 1.

Obesity and continuous spinal anesthesia: A case report, *Anesth. Analg.* 42: 547, 1963.

4. Pilcher, J.: Prolonged orotracheal intubation without tracheostomy for respiratory failure, *Brit. J. Chest Dis.* 61: 95, 1967.
5. Burwell, C. S., Robin, E. D., Whaley, R. D., and Bickelmann, A. G.: Extreme obesity associated with alveolar hypoventilation—a Pickwickian syndrome, *Amer. J. Med.* 21: 811, 1956.
6. Kautman, B. J., Ferguson, M. H., and Chermiak, R. H.: Hypoventilation in obesity, *J. Clin. Invest.* 38: 500, 1959.

Anesthesia for a Jehovah's Witness with a Low Hematocrit

PAUL H. LORHAN, M.D., AND JEROME BURCH, M.D.

Jehovah's Witnesses, whose religion forbids them to receive blood transfusions in any form, almost invariably assume personal responsibility for consequences of this compelling religious conviction. While this thera-

peutic limitation "does not leave an experienced physician with no alternate course to pursue,"¹ it frequently poses serious moral, ethical and legal implications, despite the physician's sincere respect for the wishes of his patient. An example of this situation is cited by Fitts and Orloff.² A 34-year-old man, following palliative resection of the colon, developed massive postoperative hemorrhage re-

Received from the Department of Anesthesiology, Harbor General Hospital, Torrance, California, and University of California Medical Center, Los Angeles, California.