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A Case of Morbid Obesity

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With the advent of procedures for the management of patients with extreme exogenous obesity, increasing numbers of obese patients are being treated by surgical operations. The anesthetic problems in such cases are well documented.¹⁻³ However, the successful anesthetic management of a patient weighing more than 600 pounds has not been reported. The rational and successful management of one such case is presented.

REPORT OF A CASE

The patient was a 31-year-old Negro man, weighing 632 pounds, 6 feet, 1 inch tall, who had been a 4 pound, 5 ounce perennature at birth. He had been overweight since 4 years of age, and had weighed 225 pounds by the age of 10 years, when he was hospitalized for medical evaluation. When no medical abnormality was found to explain his obesity, he was discharged, only to return at the age of 23 years, weighing 408 pounds. Subsequent placement on a starvation diet over 2½ months yielded a 65-pound weight loss. This weight re-

duction was transient, and over the next four years his weight increased to 525 pounds. A second starvation diet yielded a 125-pound reduction, but during the next three years he gained to his present weight, consuming approximately 7,000 calories per day.

Except for his size, the physical examination upon admission was unremarkable. Chest roentgenogram, electrocardiogram, renal function tests, and hemoglobin were normal. Likewise, pulmonary function tests, which included forced vital capacity, forced expiratory volume in one second and maximum midexpiratory flow rate, were normal as predicted from height and age, but not weight. Preoperative blood-gas values, measured in arterial blood drawn with the patient reclining at 45 degrees head-up in bed while breathing room air, were P_{aO_2} 51 torr, P_{aCO_2} 41 torr, pH 7.40, and base excess +2 mEq/l. The only other abnormal laboratory test results were the 5 to 10 per cent elevations of lactic acid dehydrogenase, creatine phosphokinase, and fasting blood sugar.

An elective jejunioileal bypass operation was planned. Preoperatively, the patient was informed that he would not receive preoperative medication, that his trachea would be intubated prior to induction of anesthesia, and that postoperatively, an artificial airway would be in place while a ventilator would be helping him to breathe. Written consent was obtained for the use of pancuronium to provide muscle relaxation for surgery. Upon arrival in the operating room, a percutaneous in-

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travenous catheter (16-gauge) was placed for fluid administration. In addition, a 20-gauge catheter was placed percutaneously into the left radial artery for continuous monitoring of arterial pressure and periodic arterial blood sampling operatively and postoperatively. A standard thigh blood-pressure cuff was placed on the right arm and the values compared with those obtained from the intra-arterial monitor. Blood pressure measurements with the thigh cuff were 20 to 30 torr higher for both systolic and diastolic than the direct intra-arterial readings. An ECG was attached. Lidocaine (5 ml of 4 per cent solution) was sprayed into the posterior pharynx, larynx, and trachea and an 8-mm orotracheal tube was placed without difficulty. Anesthesia was then induced with thiopental (300 mg) and maintained with nitrous oxide: oxygen, 60:40 per cent, Innovar, 5 ml slowly intravenously, and intermittent doses of fentanyl, 0.5 to 1.0 ml. Pancuronium was administered in doses sufficient to produce complete muscular paralysis and optimal surgical conditions. Exhaled tidal volume was measured with a Wright respirometer and maintained at 1,000 to 1,200 ml at a rate of 10 to 12/min. The operation was completed in three hours and 15 minutes, the neuromuscular blockade was not reversed, and the patient was taken immediately to the surgical intensive care unit with the orotracheal tube in place. During the transport, his lungs were ventilated with 50 per cent oxygen, using an Ambu bag. He was maintained on an Emerson ventilator at a tidal volume of 1,000 ml, which required a peak pressure of 30 cm H₂O. A rate of 14/min was utilized without the addition of mechanical deadspace. PaCO₂ was maintained at 33 to 40 torr and PaO₂ at 90 to 100 torr. Controlled ventilation was continued overnight, utilizing morphine sulfate, 5 to 15 mg, iv, alternated with diazepam, 5 to 15 mg, iv as needed.

Approximately 18 hours postoperatively, respiratory function was assessed with the patient off ventilator support and in a 45-degree head-up position. Assessed measurements included tidal volume, expired minute volume, vital capacity, inspiratory force, and arterial blood gases, as suggested by Pontoppidan.⁴ Subsequent weaning from the ventilator was then instituted, closely following these objective measurements. The endotracheal tube was removed two hours later. Oxygen was administered by face mask for another 2½ days, with periodic assessment of arterial blood gases. During

this period, PaO₂ was maintained at 70 to 90 torr. Recovery was completely uneventful, with no pulmonary complications. A low-grade fever (38 to 38.6 C) persisted for the first six days after operation, but blood-gas values, chest roentgenogram, and sputum characteristics (quantity and nature) were never suggestive of intrapulmonary infection. With ever-increasing ambulation, the patient became afebrile.

COMMENT

Although other techniques of anesthetic management have been suggested, we preferred a technique which would assure: control of the airway; complete neuromuscular paralysis, to expedite surgery; adequate oxygenation during and after anesthesia; and the opportunity to utilize narcotics to allay the patient's pain and still be certain of adequate ventilation, as suggested by Edelist.²

Elective postoperative mechanical ventilation may have been in part responsible for the benign pulmonary course in this case. The well-documented decreases in lung volume that occur postoperatively in patients after anesthesia and operation may have been prevented by elective controlled ventilation. In fact, blood-gas values three days postoperatively while the patient was breathing room air and febrile (PaO₂ 47 torr, PaCO₂ 41 torr, pH 7.40, base excess +1 mEq/l) were similar to the preoperative values.

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