ANAESTHESIA IN A GROSSLY OBESE PATIENT
A Case Report

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SUMMARY
A case is reponed of an extremely obese patient (214 kg) who required operation for an acute abdominal condition. Because of arterial hypertension, cardiac arrhythmia and the problems envisaged in controlling anaesthesia using conventional inhalation agents, neuroleptanaesthesia was chosen. This varies from the technique of neuroleptanalgesia in that oxygen and nitrous oxide are added. This method gave excellent control and there was freedom from the usual problems encountered when anaesthetizing obese patients.

The hazards of anaesthesia in the obese patient are well known and may cause concern both during and after operation. There are mechanical as well as physiological difficulties. Of the mechanical variety the following are the most common: venepuncture may be impossible or there might be difficulties in maintaining the position of a needle or cannula during surgery; an artery may be entered in attempts to reach a deep vein in the cubital fossa; endotracheal intubation can be difficult, as can positioning of the patient for the surgical procedure. The physiological hazards revolve round the cardiopulmonary system and pharmacological action of drugs (Catenacci, Anderson and Boersma, 1961). Pre-operatively these authors found that the most common pathological finding is arterial hypertension, followed by myocardial disease and diabetes mellitus in that order. These patients also are hampered by serious pulmonary derangement. Due to weight distribution, the elastic recoil of the thoracic cage is increased, with resultant reduction in residual functional capacity, especially in the supine and Trendelenburg positions. The oxygen cost of breathing is frequently elevated and though ventilation/perfusion discrepancies are present these patients can live, exhibiting only mild hypoxia while the Pco₂ is sometimes not elevated (Miller and Bashour, 1963). When the respiratory system is stressed by suppressant drugs, however, the delicate balance may be disturbed. This pre-operative ventilatory disadvantage can be aggravated by operative interference, especially in upper abdominal operations (Gould, 1962).

General anaesthetics or muscle relaxants may enhance the muscular weakness present in the inactive obese person (Miller and Bashour, 1963). Pulmonary artery pressure is increased, due to an increase in venous return and to cephalad movement of the diaphragm, with limitation of pulmonary expansion in certain positions.

In our experience and that of others (Catenacci, Anderson and Boersma, 1961; Miller and Bashour, 1963) obese patients need larger amounts of drugs for induction and maintenance of anaesthesia, but relatively smaller doses on a weight basis. Average induction doses of thiopentone sodium may lead to laryngospasm and time is needed to settle them on inhalational techniques. The larger doses of thiopentone sodium needed may lead to severe ventilatory depression and arterial hypotension.

All these factors were taken into account when the case to be described confronted us for an emergency operation and neuroleptanaesthesia was chosen.

CASE REPORT
A female, aged 56, was admitted with severe pain in the upper abdomen. The provisional diagnosis of perforated peptic ulcer was made by the surgeons and immediate operation was advised. She weighed 471 lb. (214 kg) and was 5 feet 6 inches tall (168 cm). Apart from her surgical condition, arterial hypertension (230/120 mm Hg) and breathlessness with atrial fibrillation were found on examination. The medicaments...
taken were digoxin tablets and diuretics. There was slight peripheral cyanosis. Her obesity was of the exogenous variety and the urine was clear of sugar and acetone. Pulmonary function was not tested due to inability of the patient to co-operate and also because her respiratory distress, aggravated by the upper abdominal condition, was clinically obvious. The pulse rate was 100 beats/min and irregular. It was noted that 45 minutes previously she had been given pethidine 100 mg with good effect. This response, as well as the cardiac arrhythmia, supported our decision to use neuroleptanaesthesia. This differs from the conventional technique of neuroleptanalgesia by the addition of neuroleptic drugs.

Premedication prescribed and given by the surgeons was atropine 0.6 mg with promethazine 50 mg. She was wheeled to the theatre on her bed, and by tying two standard operating tables together a large enough table was constructed to accommodate her comfortably. In view of expected difficulty with venepuncture, a vein was exposed beforehand. Induction of anaesthesia was started with intravenous injection of dehydrobenzperidol 110 /ig/kg body weight followed, after 5 minutes, by fentanyl 50 /ig. Within 3 minutes she appeared well sedated and methohexitone 80 mg with suxamethonium 100 mg were given before intubation; this was easy. Increments of 20-40 /ig of fentanyl were added after the return of spontaneous respiration. Pulmonary ventilation was assisted, using a carbon dioxide absorption system, and 50 per cent oxygen with 50 per cent nitrous oxide.

When the total dose of fentanyl was 240 /ig an upper abdominal transverse incision was made and accepted by the patient. Diallyl nortoxiferine was given and artificial ventilation by Engstrom ventilator started. After a total of 20 mg of diallyl nortoxiferine were encountered. A total of 500 /ig of fentanyl and 24 mg of tubocurarine was used; decurarization was performed after an additional 50-/ig dose of fentanyl and 24 mg of tubocurarine was substituted in 6-mg doses, a tracheostomy was performed after an additional 50-/ig dose of fentanyl and 24 mg of tubocurarine was used; decurarization was accomplished with atropine 0.8 mg mixed with neostigmine 2.5 mg because of a fast pulse rate. Signs of residual curarization were noted and a further 2-mg dose of neostigmine was injected. A tracheostomy was performed after an additional 50-/ig dose of fentanyl had been injected. After a total of 10 mg of the patient awoke and breathed well. Although she lost her tracheostomy tube during a bout of coughing in the ward, she made a good recovery without respiratory trouble. Physiotherapy was facilitated by using two beds tied together and rolling her from one bed to the other in order to change her position.

DISCUSSION

This patient fitted the definition of Catenacci, Anderson and Boersma (1961) of an obese patient, that is one weighing more than 200 lb. (91 kg) and being under 5 feet 6 inches (168 cm) tall. The following factors influenced us to use neuroleptanaesthesia (Foldes et al., 1966):

(a) Difficulty was envisaged in her case in stabilizing anaesthesia on fat-soluble inhalational drugs.

(b) The response to pethidine 100 mg led the authors to expect that good analgesia would be obtained with fentanyl.

(c) In view of the treatment with digitalis and the cardiac arrhythmia, halothane was considered unsafe. The neuroleptic drugs when used in relatively small doses are reputed to have little or no effect on the circulation. Fentanyl, a 4-anilopiperidine derivative, is a very potent but short-acting analgesic with no effect on the circulation apart from a possible vagal action.

(d) Depression of ventilation by fentanyl can be reversed efficiently by nalorphine. It is not difficult to differentiate respiratory insufficiency due to fentanyl from that due to muscle relaxants. In the case reported respiratory insufficiency due to fentanyl presented with a slow but deep respiratory rate, without tracheal tug.

The pulmonary hypertension present in the obese patient might be aggravated by intermittent positive pressure ventilation, through reduction in the size of the pulmonary capillary bed. However, through pulmonary inflation and correction of hypoxia and hypercarbia ventilation will tend to decrease pulmonary vascular resistance (Miller and Bashour, 1963).

ACKNOWLEDGEMENTS

We are indebted to Professor O. V. S. Kok of the Anaesthesia Department for help and support; to Dr. P. N. Swanepoel, Superintendent of our hospital, for permission to publish this case report.

REFERENCES


Les auteurs rapportent le cas d’un patient extrêmement obèse (214 kg), devant subir une intervention chirurgicale par suite d’un abdomen aigu. On décida de pratiquer la neuroleptanesthésie, en raison de l’hypertension artérielle, de l’arrhythmie cardiaque, et des difficultés de contrôler l’anesthésie avec des anesthésiques inhalatoires conventionnels. La neuroleptanesthésie diffère de la neuroleptanalgesie par l’addition d’oxygène et protoxyde d’azote. Cette méthode permit un excellent contrôle, et il n’y eut aucun des problèmes, rencontrés habituellement en anesthésiant des patients obèses.