A Non-endotracheal Airway for Surgery of the Head in Outpatients

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To keep all areas of face or mouth free for surgical access while not exposing the patient to the risks of endotracheal intubation is an obvious problem in outpatient subjects. Even the smallest practicable mask gets in the way; oral airways are not a certain protection against intrusion of the base of the tongue into the airway, and nasal airways need nicety of placement and restrict airway diameter, even when double.

The solution suggested here is to keep the tongue off the back of the pharynx by the use of a long airway, inserted into the upper end of the esophagus. This then acts as both airway and anesthetic channel, the gas or vapor passing into the pharynx, and thence to the larynx, via side holes in the airway where there are no anatomic structures to block flow (fig. 1).

METHODS

The principle of a nasopharyngeal airway used as an "obturator" when passed into the esophagus is not new. However, the secondary intention here was to utilize the airway as a breathing channel also.

To this end, ordinary endotracheal tubes of appropriate nasal or oral length, fitted with the usual connection for the rest of the anesthetic apparatus, are used. Both standard and disposable tubes have been modified; the former are sterilized by the usual means before use.

Five or six holes are made in the sides of the tube with an appropriate punch, their diameter being selected as 2/5 that of the tube itself. This allows a total final area of exit for the gases well in excess of the cross-sectional area of the lumen of the airway. The sites of the holes and the general format of the airway are shown in figure 2. The best place for the holes seems to be the second two-fifths of the tube length from the bottom, as shown.

In use, it is necessary first to establish anesthesia to the depth necessary for the ensuing surgical procedure, as passage at a very early stage is sometimes a marked stimulus to gagging. Use of nasal or oral route depends mainly on the nature of the surgery intended, but a much larger tube can be used in the mouth (indeed, larger than could be passed through the larynx), so this route is normally preferred.

After passage, it is possible to manage anesthesia in the same fashion as employed with a patient endotracheally intubated breathing spontaneously, although it is normally best to seal the mouth and sometimes the nostrils with strapping to ensure visible movement of the reservoir bag, and adequate function of a spring-loaded valve, if used.

The usual precordial stethoscope is strongly recommended to monitor respiratory exchange, if a technique not employing a reservoir bag is used.

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Use. The technique has been in use now for four years, and no serious complication has arisen. No difficulties have presented themselves in routine use after the initial realization that the airway should not be passed immediately after induction in a manner analogous to that employed with an endotracheal tube after a short-acting muscle relaxant.

Passed by the nasal route, the airway seems no more traumatic than a similar endotracheal tube; the holes do not affect the profile of the tube enough to damage the mucosa. Secretions collecting in the pharynx do not block the holes significantly, and there has been no trouble with gastric inflation, despite the tripping of the cricopharyngeal sphincter. With cricoid pressure and gentle inflation, IPPV is possible for short periods, although prolonged use is not recommended.

Two specific problems have arisen, and should be borne in mind. First, on one occasion, indirect intubation of the larynx was effected, unintentionally; this possibility can be reduced by pulling the larynx forward during passage of the airway. Second, once an airway insecurely fixed to its connection worked loose, and was found when retrieved to be working its way down the esophagus under the influence of active peristalsis.

REFERENCE

Hemodynamic Interaction between Pancuronium and Morphine

ERIC GROSSMAN, M.D.,* AND ATHOLE MCNEIL JACOBI, M.D., F.F.A.R.C.S.†

The following is a report of hypertension and tachycardia which occurred in a patient given pancuronium bromide immediately after induction of anesthesia with morphine.

REPORT OF A CASE

A 54-year-old Caucasian woman weighing 73 kg was admitted to the Hospital of the Medical College of Pennsylvania with symptoms of increasing angina pectoris. She underwent coronary angiography and was subsequently scheduled for aortocoronary saphenous-vein bypass graft. Propranolol had been discontinued one week prior to operation.

Preoperative medication consisted of morphine, 10 mg, and scopolamine, 0.4 mg, intramuscularly, one hour before the induction of anesthesia. Upon her arrival in the operating room, a catheter was inserted into the left radial artery and electrocardiographic leads were placed on the patient's limbs and chest. A large-bore intravenous catheter was inserted, and the patient was rapidly hydrated with 500 ml of Ringer's lactate solution. Heart rate, ECG, and blood pressure were recorded continuously on a Hewlett Packard 7786-A monitoring system. Initially, blood pressure was 160/90 torr, and heart rate was 78 beats/min.

Morphine, 1 mg/kg, was slowly infused while the patient was ventilated with 50 per cent nitrous oxide in oxygen. By the conclusion of the morphine induction, blood pressure had decreased to 120/60 torr, and heart rate had decreased to 54 beats/min. Pancuronium, 0.15 mg/kg, was then given to facilitate endotracheal intubation. With the onset of clinically apparent skeletal muscle relaxation, and prior to endotracheal intubation, blood pressure increased markedly to 200/110 torr, and heart rate increased to 96 beats/min. The larynx was exposed and sprayed with local anesthetic, and the trachea was easily intubated. Because the tachycardia and hypertension persisted for several minutes,