

CURRENT COMMENT AND CASE REPORTS

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NASOPHARYNGEAL ADMINISTRATION OF NITROUS OXIDE-OXYGEN ANESTHESIA: A TECHNICAL NOTE

During the administration of general anesthesia a technical problem frequently arises if a face mask cannot be applied because of the site of operation, and yet the surgical and anesthetic problems which are posed appear to make endotracheal intubation either unnecessary or undesirable. Satisfactory solutions to this problem have consisted of endopharyngeal insufflation of a potent agent such as ether or the creation of an endopharyngeal airway with the Leech airway or the Sanders cuffed tube, which can then be attached to a conventional absorption system. The purpose of this note is to describe an alternative solution which permits the administration of anesthetic

gases in a closed system without either a face mask or an endotracheal tube.

The nasal cavities are anesthetized topically with cocaine or with some other local anesthetic agent to which a vasoconstrictor amine has been added. One, or preferably two, soft rubber or plastic nasal pharyngeal airways are inserted. The largest ones that can be inserted without trauma or hemorrhage are preferable. If a single tube is inserted, the usual type of fittings are interposed between this tube and the rest of the rebreathing system. If, however, two tubes can be inserted, a special H type of adapter (fig. 1) is used which replaces the conventional Y piece. The metal fittings of the two tubes are then connected to two arms of this special H fitting and the remaining two ports are then attached to the tubing of a circle system. The lips are usually closed when the chin is supported by the anesthesiologist; if not, adhesive tape may be used. This system permits the escape of relatively little gas during ordinary respiration. If the breathing is assisted or controlled by the anesthesiologist, slight leaks will become apparent, but the effects can easily be overcome by increasing the rate of gas flow.

The obvious advantage of using two tubes over one is that a larger airway is provided. If only one tube is used, hyperpnea and hypertension may develop in a small proportion of the cases, whereas if two tubes can be inserted, as is the case in about half the patients, an unquestioned free airway is possible.

This technic is particularly well suited to operations on the eye where nitrous oxide-thiopental is quite adequate for most pro-

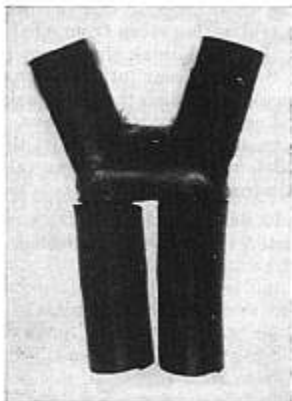


FIG. 1.

cedures. The amount of thiopental required when nitrous oxide insufflation was employed was markedly diminished by this technic. It has been employed during long surgical procedures on other parts of the body during which the prolonged use of a face piece raises the possibility of mask burns. It may also be useful in the edentulous patient in whom a tight fit with a mask may be difficult.

Epistaxis may develop but has not been observed frequently in a small series when a vasoconstrictor or cocaine was applied

topically. Also, absolute control over the airway is obviously not achieved and the method has the limitations associated with this deficiency.

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To the Editor:

Every surgeon and physician takes particular care to be sure that inhalation anesthetic agents are harmless but effective. A description follows of the test which I employ to prove the harmlessness and effectiveness of trichlorethylene.

To ascertain the harmlessness of the preparation, its toxicity when it was used during inhalation was determined. The method differs from methods reported in the literature. From a tube with a diameter of exactly 1 mm. one drop was taken and weighed carefully. The average of many tests was found to be 14.7 mg. Thereafter, toxicity was proved on male white mice, each one weighing exactly 20 gm. The mice were placed in rows, 6 mice in each. Each mouse was kept in a glass roller, the contents of which was 2225 cc. The mice were placed on a wire netting 4 cm. high. On the bottom of the vessel there was a disk of filter paper. The upper edge of the roller was sharp. The edge was smeared with vaseline and was covered with a watch glass, or a glass disk, so that it was airtight. Before the vessel was closed an adequate amount of trichlorethylene was placed on the bottom of the container. The dosage was arranged in arithmetical row from 3 to 12 drops in one row. The drops were inserted by means of a long pipe, the mouth of which was 1 mm. in diameter. After the preparation was placed in the vessel the glass disks covering the upper edge of the vessel were applied tightly and

the mice were exposed for sixty minutes to the vapors of trichlorethylene, under constant observation. Exactly sixty minutes later, the glass disks covering the mouth of the vessel were removed and the number of dead mice in each row was ascertained. From these results, that is from the number of dead and surviving mice in successive rows, the toxicity was determined by means of the original Kärber formula. The medium digression was fixed by usual method: $LD_{50} = 5.4216 \pm 0.341$ mg./gm./2225 cc. or 2.4353 ± 0.1528 mg./gm./1000 cc. This quantity equals 7 drops of the liquid. The dead mice were cyanosed; the surviving mice showed a pink color of mucous membranes, the skin of legs and ears. The recovery period varied according to individual receptivity, from twenty to ninety minutes. When the dead mice were dissected the lungs and all parenchymatous organs were found to contain considerable blood.

The above-mentioned figure of the toxicity of trichlorethylene represents the average of numerous experiments.

The medium lethal dose, 7 drops, was used for the general test. The procedure employed was as follows: 5 male white mice, each weighing 20 gm., were placed, unfed, in the rollers described previously, one mouse in each roller. Seven drops of trichlorethylene were placed on the filter on the bottom of the vessel. The bottles were made airtight immediately and the animals were observed for one hour. Exactly sixty minutes later the experiment was interrupted and the number of dead mice as-