is presented. There was no indication of respiratory obstruction until a flaccid paralysis of the pharyngeal and laryngeal musculature was produced by anesthesia with pentothal and syncurine. It must be recognized that the distortion of the normal anatomic relationships of the pharynx and larynx by anesthesia may precipitate a mechanical type of occlusion of the airway in persons who otherwise can maintain patent airways while awake or during normal sleep without drugs. The importance of including the larynx in any autopsy of a patient who dies during anesthesia is apparent as it may reveal such unsuspected causes of asphyxia. In this case, the asphyxia was relieved by lateral rotation of the head and neck until the return of muscle tonus permitted maintenance of an aperture between the left vocal cord and the mucous cyst of the right arytenoid cartilage. Subsequent to this, the anesthetic and surgical course was uneventful.

REFERENCE

1. Cunning, D. S.: Diagnosis and Treatment of Laryngeal Tumors, J. A. M. A. 142: 73–77 (Jan. 14) 1950.

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A STILET FOR ENDOTRACHEAL INTUBATION

A frequent source of difficulty in successful transoral intubation of the trachea is found in the semilunar curvature of the Magill tube whether it be made of rubber or Portex tubing. Inasmuch as the visual pathway between the anesthesiologist and the glottis, after exposure by laryngoscopy, is a straight line, it would seem rational to utilize a tube which is itself straight. Empirically, however, the passage of a straight

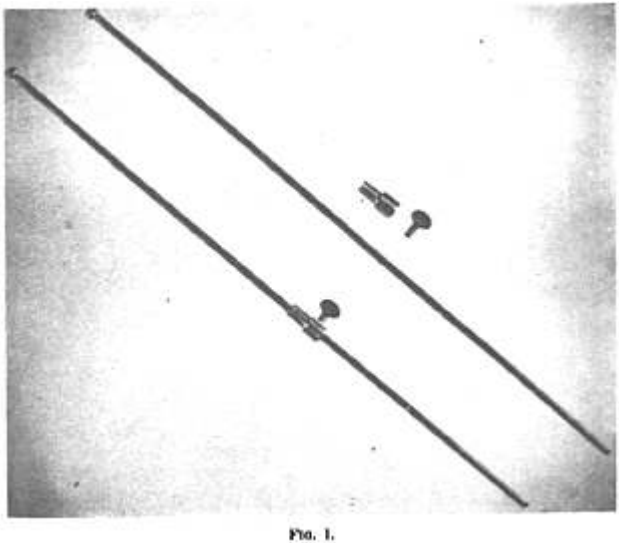

FIG. 1.

tube is not always feasible because of the presence of certain factors such as buck teeth, low lying larynx, and so forth.

In these instances there may be insufficient room between the upper and lower jaws in which to insert the endotracheal tube and still be able to visualize the glottis and the distal tip of the tube simultaneously. This is particularly true when the approach is from the corner of the mouth.

A consideration of these factors has led to the employment of a stilet in the endotracheal tube for the purpose of straightening the curvature of the belly while accentuating the curvature of the distal end.

At first, knitting needles, both of celluloid and plastic, were used, but they had several disadvantages. The danger of sudden breakage while extracting the stilet became evident in several cases in which the endotracheal tube had to be removed because the distal tip of the stilet had broken off. Another factor which led to their being discarded was the inability to change the curvature of the distal end at will since this required immersion in boiling water for shaping of the stilet. Third, precise guidance of the tube into the glottis was often difficult owing to the fact that the tube revolved about on the stilet, generally at the crucial moment of its insertion.

A stilet was designed to overcome these disadvantages and has been in use for the past three years. Copper tubing, 3/16 inch in diameter, is used because it is malleable enough to allow for changing its shape at will, yet is rigid enough to be easily controlled in inserting the endotracheal tube. Brass tips are brazed into each end; the large one at the distal end acts as a safety

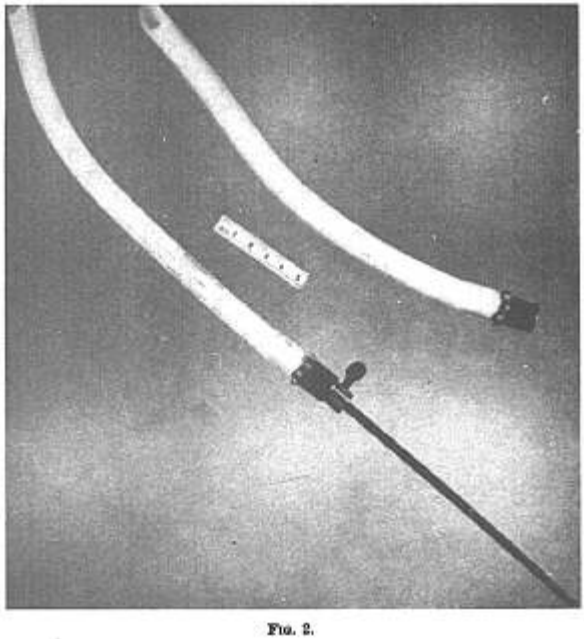

FIG. 2.

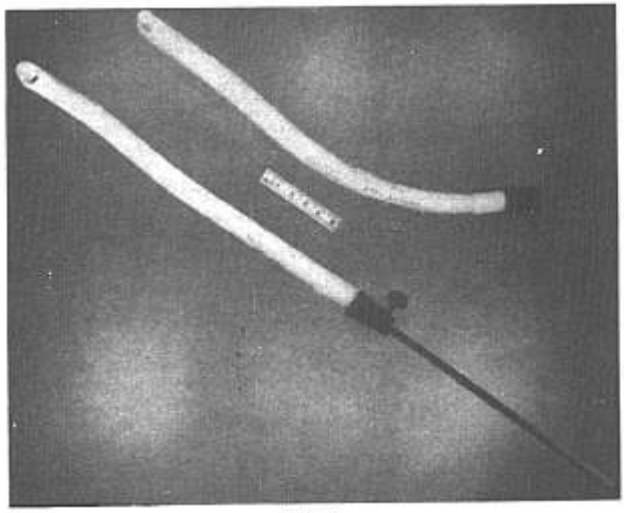

FIG. 3.

device against serious trauma to the trachea anteriorly should it inadvertently be pushed past the end of the endotracheal tube. The proximal tip is the same diameter as the copper tubing to allow for its use in smaller endotracheal tubes whose slip-joints do not permit the entrance of the large brass head.

As a stabilizer of the endotracheal tube, a brass runner with thumb-screw is placed on the stilet. This is machined to enter the standard slip point and hold it snugly. The stilet is then advanced into the tube until the brass tip just shows at the short end of the bevel. The thumb-screw is gently twisted to set the runner in place and the tube is ready for use.

The stilet (fig. 1) is made in lengths varying from 12 inches for use in most rubber and portex tubes to 16 inches for use with some types of anode tubes which are frequently longer.

Dwyer, Kronenberg and Saklad (1) have shown that a morphologically correct shape for an orotracheal tube is that of the letter "S." Such a tube is particularly difficult to insert without a stilet. The stilet described suits the need admirably. As soon as the stilet, which should be lubricated before its insertion, is withdrawn, the tube assumes its previous "S" shape.

Figure 2 shows the "S"-shaped tube before and after being threaded on the stilet.

Several points should be mentioned in connection with the use of this stilet. If a straight-bladed laryngoscope such as the Flagg or Guedel models are used, the stilet may be used to advantage in the straight position (fig. 3).

If the Macintosh laryngoscope is used the curved position (fig. 2) should be employed, especially if the tube is passed obliquely through the pharynx from the right side. This enables the anesthesiologist to keep both the glottis and the tip of the tube in view until the moment of insertion between the vocal cords. As soon as the latter maneuver has been completed, the stilet should be withdrawn 2 to 3 inches before the endotracheal tube is advanced farther. Forward pressure on the stilet

in the curved position may traumatize the trachea. As soon as the distal part of the tube is inserted, the stilet is entirely withdrawn.

SUMMARY

A stilet for orotracheal intubation is described. Its advantages and method of use are elaborated. It is impossible to create a "foolproof" stilet. Trauma to the glottis, larynx and trachea will be obviated only by the creation of a "foolproof" anesthesiologist.*

REFERENCE

1. Dwyer, C. S.; Kronberg, S., and Saklad, M.: Endotracheal Tube; Consideration of Its Traumatic Effects with Suggestion for Modification Thereof. Anesthesiology 10: 714–728 (Nov.) 1949.

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* These stilets may be obtained from Mr. Charles H. Hoppe, 555 Prospect Place, Brooklyn, New York.

CORRESPONDENCE

To the Editor:

This is written as a "Letter to the Editor" to point out some possible considerations regarding the article by Dr. Beecher dealing with the optimal size of endotracheal tubes, which was published in the November 1950 issue of ANESTHESIOLOGY.*

It is true that in many patients adequate exchange can be carried on through a size 32 endotracheal tube under light anesthesia and with "homeostatic reflexes" intact. It is also true that, fortunately, many patients probably breathe *around* a tube of that size. I believe it is both fallacious and dangerous, however, to recommend the employment of tubes of such size in such a sweeping manner, for the following reasons:

1. There is no evidence in the article presented to show that the effort required to breathe through such a tube is no greater than the effort required to breathe through a tube corresponding, at least roughly, to the caliber of the laryngeal orifice. It is true that a patient may "stand" a small tube and even that adequate exchange may be maintained; but *what is the cost to the patient?*
2. Even if it is granted that at least some patients will breathe around a small tube it is not guaranteed that all people will, nor that those who do some of the time will continue to breathe around the tube all of the time.
3. The insertion of a suction catheter through even as large a tube as can be used is embarrassing to respiration in many cases in which frequent suction is needed. Obviously, the embarrassment is aggravated when the size of the suction catheter approaches the internal diameter of the endotracheal tube. Many times, particularly in lung cases, a large suction catheter must be used.
4. I would like to refer readers to the scientifically sound chapter in MacIntosh and Mushin, "Physics for the Anesthetist," dealing with the problem of resistance and instanteneous flow capacity (Chapter XII, page 122). The latter is the essential factor which Dr. Beecher has totally ignored.

Until it has been shown that no *increased effort* is required to maintain normal blood gas values on the part of a large number of patients undergoing a variety of surgical procedures it is my belief that Dr. Beecher's article should be read with considerable reservation.

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* Beecher, H. K.: A Note on the Optimal Size of Endotracheal Tubes Based Upon Studies of Blood Gases, Anesthesiology 11: 730–732 (Nov.) 1950.