

From a position above and forward of the patient's head, the conventional laryngoscope "L" is inserted in the usual manner with the patient's throat being initially sprayed with a topical antiseptic. The introducer **10** is advanced like a bronchoscope. It is to be noted that the shape of the handle provides the physician with good manipulative control. The physician is able, in most cases, to visualize the vocal cords although with some patients this is not possible.

With the right hand or by using an assistant, the physician places guide line **11** into the insertion passageway **34** in the handle of the device. The guide tube **11** is slowly advanced through the rigid tube **12**. The introducer **10** is advanced beyond the uvula and epiglottis. The tip of the introducer is preferably inserted between the vocal cords. The assistant may then advance the guide tube until the tip extends down into the bronchus. At this position as shown in FIG. 4, the tip of the guide tube **11** is in proper position for insertion of the ET. The guide tube will now extend from the curved tip of the rigid tube into the bronchus.

Referring to FIG. 5, the introducer may now be slowly removed leaving the guide line in place. As the introducer is withdrawn, the assistant will apply a slight pushing force on the proximal end of the guide line so that the guide line **11** remains in place as the introducer is withdrawn. In FIG. 5 the laryngoscope remains in position until the instrument is removed.

The proximal end of the guide line **11** may now be inserted into the distal end of the selected endotracheal tube "ET" along its entire length. The ET may be pushed down along the guide tube into the mouth and into the bronchus. The position is checked by auscultation and secured in place. FIG. 5 illustrates the introducer once it is removed, leaving the guide tube in place. FIG. 6 shows the guide line **11** being inserted into the distal end of endotracheal tube ET. FIG. 7 illustrates the endotracheal tube ET being advanced into the trachea along the guide tube until properly positioned.

FIG. 8 illustrates an alternate embodiment of the introducer of the present invention which is generally designated by the numeral **100**. In this embodiment, the introducer includes an elongate axially extending guide tube **112** which has an upwardly curved tip **114**. The proximal end of the guide tube is provided with a viewer **116** which provides visualization through the lumen **118** of the guide tube. An aperture **120** is provided in the guide tube at an intermediate location which facilitates insertion of the guide line **111**. Additional connections for oxygen or other gases may also be provided such as connection **124**. A tube **125** for transmitting oxygen or other gases extends coaxially along the rigid guide tube. As has been described previously, a fiberoptic tube **130** may also be provided attached to the guide tube **112** for transmitting light and images from the distal end to the eye viewer **116**.

A connector **132** is secured to the guide tube at an intermediate location spaced distally from the aperture **120**. The connector **130** is a conventional connector to which a conventional laryngoscope handle **140** of conventional design may be attached. In this manner, the device is provided with a pistol grip type handle which may be preferred by some physicians. Further, some physicians may prefer to use the laryngoscope handle **140** because of familiarity.

The embodiment shown in FIG. 8 is used in the manner as described with reference to FIGS. 4 to 7 in which the introducer **100** is introduced beyond the uvula and epiglottis. Visualization of the vocal cords is provided through the eye viewer **116**. Once the tip of the introducer is properly

positioned between the vocal cords, the guide tube can be inserted into the aperture in the guide tube intermediate the eyepiece and the handle. The device can be properly manipulated by the physician using the handle and either the physician or the assistant can advance the guide cord until the tip extends into the bronchus.

FIGS. 9 and 10 show yet another embodiment of the introducer of the present invention generally designated by the numeral **200**. Again, the introducer includes a longitudinally extending rigid guide tube **212** of stainless steel or other similar material having a lumen **214**. The guide tube has a curved tip or distal end **216** and the tube extends through a handle **210** terminating at a viewer **215** at the proximal end. A fiberoptic light tube **260** is attached and extends coaxially along the rigid tube extending from the handle to the distal end **216**. The handle is shown as a pistol grip type handle which has a body **232** which extends circumferentially around the rigid tube. A depending grip **240** which extends angularly with respect to the axis of the guide tube is provided. The grip is sized to be easily gripped in the fingers and palms of the hand of the user. An aperture extends in the rear of the body portion of the handle communicating with the lumen of the guide tube. The insertion aperture facilitates insertion of the guide wire or cord into the lumen of the guide tube.

A compartment **250** within the handle is adapted to receive and house an energy source such as one or more batteries which may be used to provide illumination which is transmitted along the fiberoptic tube so that the area at the end of the guide tube may be illuminated for better visualization.

In the embodiment of FIGS. 8 and 9, the advancement of the guide line is facilitated by a feed mechanism **280** which is positioned on the side of the handle. The feed mechanism consists of a pair of wheels **251** and **252**, each of which are rotative about a shaft **256** attached to the handle. Preferably the surface of the wheel are either ribbed or provided with a slight concavity **255** as shown. The mating concavities are sized to approximate the diameter of the guide wire or cord. Accordingly, the guide line **211** is inserted between the wheels as best shown in FIG. 10. The device is used as described with reference to FIGS. 4 to 7 with the guide tube advanced either by manually turning the drive wheel or by energizing the motor at switch **275**.

Accordingly, it will be seen that the present invention provides a tube guide introducer which is simple, relatively easy to master, and may be inexpensively manufactured. The device is versatile in that it may be used with a conventional handle such as a laryngoscope handle and may also be used to administer gases such as oxygen or used with a jet ventilator.

It will be obvious to those skilled in the art to make various changes, alterations and modifications to the tube guide introducer described herein. To the extent such changes, alterations and modifications do not depart from the spirit and scope of the appended claims, they are intended to be encompassed therein.

I claim:

1. A medical instrument for position a guide line in the trachea of the patient along which an ET may be inserted, said instrument comprising:

- (a) a rigid elongate tube having a distal and proximal end, said tube defining a lumen;
- (b) visualization means at the proximal end of said tube;
- (c) an introducer aperture communicating with said lumen for inserting a guide line in said lumen to extend to the proximal end;