

FLEXIBLE TIP STYLET FOR USE WITH AN ENDOTRACHEAL INTUBATION DEVICE

TECHNICAL FIELD OF THE INVENTION

This invention relates in general to medical devices, and in particular to a flexible tip stylet for use with an endotracheal intubation device.

BACKGROUND OF THE INVENTION

In a variety of medical situations, it is necessary to place a ventilator tube through a patient's mouth and into the trachea in a procedure known as intubation. During this process, the ventilator tube must be negotiated over the tongue, past the epiglottis and through the vocal cords while avoiding the esophagus. For a variety of anatomical reasons, this procedure can often be extremely difficult. For example, a difficult intubation may be anticipated in patients with short muscular necks, receding jaws, large thick tongues, high arched palates, cervical spine or mandibular immobility, hematoma, abscess or inflammation around the posterior pharynx or larynx, facial fractures or anatomical deviations from normal. In addition, many ambulance personnel and paramedics are poorly trained and inexperienced in using an intubation device. Thus, whenever there is a difficult intubation, the patient may suffer damage to internal organs.

Prior attempts to alleviate the difficulties inherent with intubations have not resulted in satisfactory solutions. For example, one previous method disclosed in U.S. Pat. No. 3,996,939 to Sheridan et al., Dec. 14, 1976, is a bendable wire around which the intubation tube is placed. A wire or metal rod is hermetically sealed in a tubular plastic sheath, which is then inserted into the intubator. The metal wire is then bent to the appropriate shape for insertion, which often requires several attempts. For difficult situations, these devices are tedious to use and can slow a procedure in which speed of completion is often critical in nature.

Further attempts to alleviate the difficulties of intubation are disclosed in U.S. Pat. No. 2,541,402 to Caine, Feb. 13, 1951, and U.S. Pat. No. 3,314,431 to Smith, Apr. 18, 1967. The Caine and Smith patents both disclose stylets that have a bendable tip which can be bent while the stylet is being inserted into the throat of a patient. The purpose of the remote bending is to attempt to help the insertion by maneuvering around the internal obstructions. Unfortunately, both the Caine and the Smith devices do not provide adequate flexibility to easily maneuver past all the potential internal obstructions.

In a related problem during intubation, it is frequently necessary to provide suction to the throat to remove any foreign objects such as blood or vomit. Previously it has been necessary for medical personnel inserting the intubation tube to take their eyes off the insertion process to obtain a suction device to clear the throat. Since it is such a difficult task to insert the intubation tube in the first place, any distraction makes the task more difficult.

An attempt to resolve the suction problem is disclosed in U.S. Pat. No. 4,275,724 to Behrstock, June 30, 1981. Behrstock discloses an inner tube surrounded by an outer tube. The inner tube may be used to suction materials from the airway by sucking on the end of the inner tube during the insertion of the outer tube. This method also requires the medical person inserting the

tube to look away from the task at hand in order to suck on the end of the tube. Therefore, there is a need for an intubation tube stylet that is both easy to insert and allows for suction during the insertion thereof without the necessity of the operator looking away from the insertion process.

SUMMARY OF THE INVENTION

The present invention disclosed herein comprises a method and apparatus for an improved intubation stylet which eliminates or greatly reduces problems associated with prior intubation stylets. The present invention allows the easy insertion of an intubation tube into the airway of any patient and allows for simultaneous suction without looking away from the insertion.

In accordance with one aspect of the invention, a flexible stylet is slidably received within an intubation tube. The stylet has a tip extending beyond the insertion end of the intubation tube. The tip has a remotely adjustable, preformed shape which facilitates insertion of the intubation tube into the airway of a patient and does not require deformation of the intubation tube itself.

In a further aspect of the present invention, the preformed shape comprises a general Z-Shape in which a first portion lies along a linear axis of the stylet. A second portion is bent at an angle to the linear axis, and a third portion extends from the second portion approximately parallel to the linear axis to form the general Z-Shape. The stylet tip is adjustable from the Z-Shape to a linear shape by a plunger and a rod interconnected to the stylet tip through a handle. By activating the plunger, the interconnected rod is forced into the tip of the stylet, straightening the tip into a linear shape. The stylet may be inserted or removed from an intubation tube when the tip is forced into a linear shape, and the intubation tube may be inserted into the airway of a patient when the stylet tip is in the general Z-Shape.

Additionally, the handle for the stylet has a passageway therethrough to connect the tip of the stylet to a suction line. By a simple hand movement, the medical person inserting the intubation tube can apply suction without the necessity of looking away from the insertion.

The stylet is preferably formed from relatively inexpensive materials such as plastics. Although it is possible to use metallic parts, metal is used only where necessary in order to keep costs as low as possible. Thus the stylet may be used once and disposed of to prevent the spreading of disease therefrom.

It is a technical advantage of the present invention that a difficult intubation may be successfully made even by poorly trained medical personnel. Additionally, the improved stylet is easy to manufacture and is made from relatively low-cost materials, allowing the stylet to be disposed of after use. It is a further technical advantage of the present invention that it is possible to apply suction to the airway without the necessity of looking away from the insertion.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and for further advantages thereof, reference is now made to the following Detailed Description, taken in conjunction with the accompanying Drawings in which: