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A Modified Endotracheal Tube for Laser Microsurgery

To the Editor:—The use of the carbon dioxide laser in microsurgery of the larynx has gained wide acceptance since its introduction in 1972.¹ In most cases the nature of the lesions treated precludes the use of the Carden tube to inflate the patients' lungs intermittently during the procedures. Accordingly, a conventional, small endotracheal tube has been employed. The intense heat generated by the laser beam necessitates protection of the tube to prevent ignition.² This has been done by wrapping the endotracheal tube with a self-adherent aluminum foil.³ In our experience, however, this is not without danger. When small tubes are employed it is not uncommon for them to become totally occluded as a result of compression by the foil as the tube accommodates to the curvature of the posterior pharynx. On occasion the tape would loosen and its edge injure pharyngeal and laryngeal tissue. In addition, concern has been expressed over the possibility of further tissue damage by deflection of the laser irradiation from the reflective surface of the foilcovered tube. Norton⁴ designed a flexible metal tube that is matte-finished to diminish light reflection. This device is relatively expensive and not totally air-tight. In addition, the user is required to sign a "new device" form releasing the manufacturer from any liability resulting from the use of the tube.

Early users of the laser protected the anterior tracheal wall and endotracheal tube cuffs with moist cottonoids and gauze. This suggested a simple, inexpensive modification of existing endotracheal tubes that is compatible with patient safety. Commercially available muslin, cut on the bias into half-inch strips, is wrapped in a spiral manner about a plastic or red rubber endotracheal tube (fig. 1). The proximal end is secured with a heavy silk tie. The tube is immersed in a basin of saline solution prior to insertion and is kept moist by periodically wetting the external surface during the procedure. Repeated exposure of the same site to multiple short bursts of CO₂ laser energy failed to char the outer covering of an appropriately moistened tube. Slight singeing of the cotton was observed in one instance where a portion of the tube was permitted to dry.

We have employed these muslin-covered tubes several dozen times in sizes ranging from 3 to 6 mm, without untoward effect.



FIG. 1. Aluminum foil-wrapped tubes occluded during passage. Note sharp torn edges on left. The plastic tube was penetrated by the CO₂ laser energy, while the red rubber tube was charred. The muslin-wrapped tube was totally unaffected by repeated exposure to the light beam.

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