The electromyographic endotracheal tube (EMG-ETT) is a relatively new tool used to measure integrity of the vocal cord structures during surgery. We describe a case in which an EMG-ETT was inserted for the operative period but not replaced with an ETT during the immediate postoperative period. Intensive care unit nurses had difficulty suctioning the EMG-ETT. The patient was not provided the pulmonary toilet necessary until the EMG-ETT was removed and replaced with a regular ETT. The purpose of this article is to make anesthesia providers aware that when mechanical ventilation is required during the postoperative period, the EMG-ETT should be removed and replaced with a regular ETT to facilitate pulmonary toilet.

Key words: Endotracheal tube, electromyographic, suctioning.
need for ETT suctioning. The patient was extubated a few days later and had no long-term sequelae after receiving pulmonary toilet and ventilation. Atelectasis was resolved within a few days. The EMG-ETT was partially cut to discover why the suction catheter could not be passed (Figure 1).

**Discussion**

Nowhere in the product information and instructions for the EMG-ETT is the provider instructed to replace this type of tube at the end of the case with a regular ETT. Another concern is that if the patient was difficult to intubate and the EMG-ETT needed to be changed, a stiff tube changer cannot be used. The product description states, “The tube is fitted with four stainless wire electrodes (two pairs) which are embedded in the silicone of the main shaft of the endotracheal tube and exposed only for a short distance, approximately 30.0 mm, slightly superior to the cuff, for contacting the vocal cords.” As shown in Figure 2, the wires from the EMG-ETT were entangled, not allowing for passage of a suction catheter for pulmonary toilet. It is believed that numerous, frequent suctioning attempts entangled the wires. (The pediatric fiberoptic scope could not get through the entangled wires for suctioning.) The EMG-ETT is not comparable to the anode ETT (Figure 3). With the anode ETT, it is not possible for the wires to enter the middle of the ETT because the wires are embedded in the plastic.

In 1996, the US Food and Drug Administration approved the EMG-ETT device for monitoring RLN function during surgery. This approval was based in part on research by Eisele regarding the EMG-ETT device’s use on the first 10 of 31 patients studied. Before the use of the EMG-ETT, 2 needle laryngeal electrodes or paired hook-wire electrodes would be placed in the true vocal cords to monitor electrical stimulation of the vocal cords.

Figure 4, Figure 5, and Figure 6 show the EMG-ETT and how it works. According to Eisele, the advantage of the EMG-ETT compared with the electrodes is “…simplistic in establishing contact and, should tube malposition occur during surgery, in reestablishing electrode contact.” Eisele further suggests that the incorporation of the electrodes simplifies management of the EMG-ETT and keeps the electrodes out of the surgeon’s way.

**Conclusion**

Although it may be unusual for the wires to become kinked, making it impossible to provide adequate pulmonary toilet, anesthesia providers must be aware of this possibility. The purpose of this article was to make anesthesia providers aware that if mechanical ventilation is required during the postoperative period, the EMG-ETT should be removed and replaced with a regular ETT to facilitate pulmonary toilet.
REFERENCES

AUTHORS
Eileen Youshock Evanina, CRNA, MS, is program director, Wyoming Valley Health Care System/University of Scranton School of Nurse Anesthesia, Wilkes-Barre, Pa. She is a doctoral candidate in Theory and Research Development at New York University, New York, NY.
Jill L. Hanisak, CRNA, MS, is a practicing CRNA at Lehigh Valley Hospital and Health Care Network Anesthesia Services, Allentown, Pa.

Figure 4. Electromyographic endotracheal tube with electrodes

Figure 5. Paired electrodes above electromyographic endotracheal tube cuff

Figure 6. Electromyographic endotracheal tube wire electrodes touching true vocal cords

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