tion interval on the Greenblatt nerve stimulator to 3.5 seconds by the addition of a single 150 K ohm resistor to the internal electrical circuit (fig. 1). This modification allows for satisfactory use of the apparatus as a clinical nerve stimulator as well as peripheral nerve locator. Experience during patient monitoring of muscle relaxant effects substantiates this conclusion.

REFERENCES

CASE REPORTS

Failure of Inflatable Cuff Resulting in Foreign Body in the Trachea

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FRANK MOYA, M.D.*

A 34 year old man was admitted for a tympanoplasty with graft. Anesthesia was induced with intravenous thiopental in divided doses followed by succinylcholine. A 34 French, rubber, Murphy type endotracheal tube, with cuff, was inserted atraumatically through the glottis with the aid of a no. 3 Wis-Hepple laryngoscope. Approximately 5 ml. of air were required to inflate the cuff properly. Maintenance of the patient on nitrous oxide, halothane, and oxygen proceeded uneventfully for approximately fifteen minutes when a leak developed in the circle system at the site of the inflatable cuff. It was found impossible to inflate the cuff due to the large leak. The patient was extubated and reintubated easily with another tube of similar design. The tube which had been removed revealed a 6 x 8 mm. defect in the latex rubber cuff (fig. 1). At the end of operation, bronchoscopy was performed and the missing piece of latex rubber was found at the carina. It was easily removed with suction. The patient was discharged from the hospital following an uneventful recovery.

The cuff had been inflated with 10 ml. air and had held pressure well immediately prior to its use in this patient. There had been no mechanical abrasion against the patient's teeth or other objects during intubation. Therefore, it appears that spontaneous rupture of the cuff had occurred owing to a material defect or to deterioration because of aging, improper care or other factors.

It is common practice to clean and re-use endotracheal tubes until the condition of the catheter body or inflatable cuff renders their continued use inadvisable. Common reasons for discarding catheters include significant alteration in surface texture, curvature, tip, flexi-

Fig. 1. Ruptured inflatable cuff and free portion of cuff found in patient's trachea at the level of the carina.

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bility of the tube, the cuff and attached inflating tube. Factors contributing to deterioration include anesthetic agents, cleaning solutions, mechanical scrubbing, heat, light, and age. Our own practice is to soak and wash catheters in a solution of Haemosol, utilizing a catheter brush. They are then rinsed, soaked in a 1:12 per cent solution of Wescodyne (ethanol-iodine complex), rinsed again, and air dried.

The failure of such equipment probably begins in the selection of materials by the manufacturer, the design and construction of the equipment, its employment by the anesthesiologist and finally, the storage and other care given it. Procurement of quality equipment, its proper care, regular inspection and planned retirement program should decrease the incidence of traumatic rupture during the conduct of a case.

REFERENCES

Reinforced Endotracheal Tube—Diversion of Air from Cuff Balloon Producing Obstruction

M. S. Kohli, F.R.C.S., F.A.C.A.,* and R. S. Manku, M.S.†

Anesthesia was induced in an adult man with intravenous thiopental and succinylcholine was given to facilitate intubation which was accomplished with a reinforced cuffed endotracheal tube. Nitrous oxide-oxygen-ether was then administered. On recovery from the effects of succinylcholine, d-tubocurarine was given.

With inflation of the cuff, the patient showed signs of expiratory wheezing. The cuff was deflated, anesthesia was deepened, and controlled breathing was established. The cuff was reinflated and expiratory obstruction and wheezing were again noticed. A catheter was passed through the tube with no difficulty but the patient continued to show signs of expiratory obstruction and wheezing. The cuff was deflated, an oropharyngeal gauze pack was placed and controlled breathing was continued with no signs of obstruction. The operation continued normally and the patient recovered uneventfully.

Next day another patient was anesthetized as above, and was intubated using the same endotracheal tube, the cuff of which had been tested and found to be intact with no leak. The cuff was now inflated and immediately the patient showed signs of wheez-

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FIG. 1. Reinforced endotracheal tube showing built-in cuff and bevel.