if I only focused on objects near the floor. I felt more comfortable and almost normal instantaneously.

The immediate improvement in my well-being could not have been the result of spontaneous recovery from atracurium. I explain all my difficulties while supine by the inability of muscle groups to act against gravity. Since many anesthetized patients are still partially paralyzed during recovery, my observation adds weight to positioning them in the lateral decubitus.

DAVID C. CHUNG, M.D.
The Mississauga Hospital
100 Queenway West
Mississauga, Ontario
Canada L5B 1B8

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Intractable Cardiac Arrest in Children Given Succinylicholine

To the Editor—Intractable, unexpected cardiac arrest has been reported, especially in children, following induction of anesthesia with halothane and succinylcholine (SCh). In some cases, the child was subsequently shown to have Duchenne’s muscular dystrophy (DMD).1

During the past 12 months, four boys younger than 8 years of age have died in the United States during or following halothane and SCh (Malignant Hyperthermia [MH] Hotline data). Evidence of massive rhabdomyolysis was noted in all, and hyperkalemia and acidosis in most. In one case, the diagnosis of DMD was made based on the absence of dystrophin in the muscle specimen.

In the other cases, necrotizing rhabdomyolysis was noted on muscle specimens obtained at autopsy. Whether these changes are indicative of DMD in all cases is unclear.

This catastrophe is not limited geographically. The German MH Hotline (courtesy of Dr. Uwe Schulte-Sasse of Heilbronn) has accumulated 11 similar cases.

We speculate that six cases of this syndrome of sudden, intractable cardiac arrest would be expected each year in the United States, with an approximate 60% mortality rate.

Typically, the child is apparently normal with no major motor developmental delays but manifests this abnormal response shortly after administration of SCh. Based on data obtained during resuscitation, the arrest is likely due to hyperkalemia, although rhabdomyolysis and acidoses are also striking features. Hyperkalemia is present during resuscitation, limiting its success.

The earliest sign is a serious arrhythmia, such as pronounced bradycardia, that progresses rapidly to asystole or ventricular fibrillation.

When such a syndrome occurs in a child, we suggest immediate therapy for hyperkalemia, including glucose, insulin, bicarbonate, and calcium. Dantrolene is an appropriate secondary drug because it is not acutely toxic and the clinical differentiations from malignant hyperthermia susceptibility have not been clarified. Even in the absence of a direct relationship, dantrolene would not be harmful and might be helpful.

Surviving children should be evaluated for muscular dystrophy. We suggest that muscle specimens be frozen and analyzed for dystrophin levels.

We have notified the Food and Drug Administration of this potential problem and recommend that anesthesiologists carefully consider the indications for use of SCh in young children.

A full report concerning these cases is in preparation.

HENRY ROSENBERG, M.D.
Department of Anesthesiology
Hahnemann University
Broad and Vine Streets
Philadelphia, Pennsylvania 19102-1192

GERALD A. GRONERT, M.D.
Department of Anesthesiology
University of California, Davis
TB 170
Davis, California 95616

REFERENCES

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A Double Tube Technique of Adult Fiberoptic Assisted Tracheal Intubation

To the Editor—The problems associated with fiberoptic bronchoscope (FOB) assisted endotracheal intubation addressed by Marsh result mainly from attempts to pass relatively large internal diameter endotracheal tubes (ETT) over small external diameter scopes. Marsh considered the problem of the size discrepancy permitting the bevelled tip of the ETT to protrude laterally from the FOB so that it may catch on structures such as the aryepiglottic folds. To minimize the size discrepancy, he suggested that one can thread a smaller ETT with the
Fig. 1. The “inner” (smaller) tracheal tube, with proximal end cut on an angle and string attached through a perforation made in the tube.

connector removed into the larger ETT and pass that combination over the FOB.

Another mechanism for failed FOB assisted intubation not mentioned by Marsh is that the relatively rigid endotracheal tube may resist following the more flexible FOB (the “rigidity gap”). Progressively more forcible attempts to advance the endotracheal tube may retract the FOB from the larynx or damage it.1 The solution described by Marsh makes the ETT even more rigid and less likely to follow the more delicate FOB. In these circumstances, there is a greater risk in damaging the FOB or traumatizing the patient.

We recently experienced a case similar to one described by Moorby and Dierdorf2 in which inadvertent esophageal intubation occurred despite initial bronchoscopic visualization of the trachea. To overcome this problem, we also devised a double tube method for FOB assisted tracheal intubation. In our method, the inner smaller ETT is advanced first to support the more delicate and flexible FOB. The definitive ETT is then advanced over the combination of FOB and inner ETT. This variation in the approach addresses problems related to discrepancies in both diameter and rigidity described above. One of the authors (JAF) has since successfully used this double tube method for 88 consecutive FOB assisted endotracheal intubations.

Confidence in success with this method requires careful attention to details of the technique.

• Equipment preparation. We recommend a 2.5-mm difference between the internal diameters of the small uncuffed and definitive cuffed tubes. The 15-mm connector is removed from an uncuffed smaller diameter ETT designated as the “inner ETT.” The proximal end is then cut on a 45° angle. An “O” silk on a 37-mm needle is passed through the proximal end, and a knot is tied securely, leaving a small loop of thread (fig. 1). The outside of the inner ETT is well lubricated and inserted into the proximal end of the definitive (or larger) cuffed ETT such that the tip of the inner ETT protrudes 5 cm beyond that of the larger ETT (fig. 2). The FOB is lubricated and passed through the inner ETT using the silk string for counter traction. The tracheal tubes are then secured to the body of the bronchoscope. It is essential that, in tipping the larger ETT to the FOB, sufficient space is left between the 15-mm connector of the 8-mm internal diameter ETT and the FOB for the string to move freely when the smaller ETT is advanced (fig. 3). In the final configuration, the tip of the inner ETT is protruding 5 cm below the distal end of the definitive ETT tube, and its string is confirmed to be able to move freely. The cuff of the 8-mm ID ETT should be fully deflated and all surfaces well lubricated.

• Patient preparation. The patient is prepared for fiberoptic intubation in the normal manner. For most patients who need fiberoptic intubation, this will require an anti-sialogogue, small doses of intravenous sedation, and excellent topical anesthesia.

• Tracheal intubation. Once the FOB has passed into the trachea, the free hand is used to advance the smaller ETT over the well lubricated FOB past the glottis. Its string must be free to slide between the FOB and the definitive ETT. Once the inner ETT is in place, its further advancement on the FOB is prevented by gripping the string firmly with the hand holding the FOB. The proximal fixation of the larger ETT is then released, and it is advanced over the combined FOB and inner ETT into the proper position. The definitive ETT is then held in place while the FOB and the inner ETT are withdrawn in one motion. After confirming correct placement, the larger ETT is secured in place and the patient is anesthetized.

We recommend this method for routine oral FOB assisted intubation when there is a greater than 4-mm difference between the outer diameter of the FOB and the internal diameter of the tracheal tube. It may be lifesaving in situations in which there is no opportunity for repeated tracheal intubation attempts, such as with patients with edema, friable or ulcerated pharyngeal mucosa, burns, or laryngeal and upper airway tumors, or in difficult reintubations.3 We have not used this method when using the nasal route.

John Oyston, M.B., B.S., F.F.A.R.C.S.
Teaching Fellow

Maev Hennessy M.B., B.Ch., B.A.O.
Resident

Fig. 2. Configuration prior to mounting on the fiberoptic bronchoscope. The smaller tracheal tube is passed through the proximal end of the larger definitive tracheal tube.
JOSPEH A. FISHER, M.D., F.R.C.P.(C.)
Anaesthetist-in-Chief

Department of Anaesthesia
University of Toronto
Mount Sinai Hospital
600 University Avenue
Toronto, Ontario, M5G 1X5 Canada

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