MOTOSHI KAINUMA, M.D.
Assistant Professor of Anesthesiology
YASUHIRO SHIMADA, M.D.
Professor and Chairman of Anesthesiology
Department of Anesthesiology
Nagoya University School of Medicine
65 Tsurumai-cho, Showa-ku, Nagoya 466
Japan

REFERENCES
(Accepted for publication December 3, 1987.)

The Gum-elastic Bougie: Old but Still Useful

To the Editor.—We have observed, during our period of practice of anesthesiology in North America, that an instrument which is considered a part of standard anesthetic equipment at home is not readily available here. We highlight this fact as we think the endotracheal tube introducer, or gum-elastic bougie, offers advantages over other equipment used in cases of difficult tracheal intubation.

The introducer is 60 cm long and 15 FG in diameter. The tip is angled at 40°, 3.5 cm from the end. It is built up on a woven polyester base that combines both stiffness and flexibility at body temperature. It is easily sterilized, and so can be re-used.

In a situation where visualization of the vocal cords is difficult, the introducer is lubricated, then directed posterior to the epiglottis, with the tip angled anteriorly (fig. 1). Using the introducer as a guide, the endotracheal tube (ETT) is passed over it into the desired position.

Other introducers used inside the ETT have the major disadvantage of being too rigid. Because they need to be angled anteriorly to enable them to be passed into the larynx, it is frequently difficult, if not impossible, to manipulate the tube and introducer off the anterior wall of the larynx and into the trachea. The flexibility of the "gum-elastic" bougie overcomes this problem. This flexibility also makes any damage to the vocal cords or trachea unlikely, as the introducer will bend if undue force is applied in the face of resistance.

* Downs Surgical Inc., Decatur, Georgia

FIG. 1. Bougie directed into trachea, ETT inserted over bougie into position.
Local trauma is always a potential hazard with any manipulation in the laryngotraheal region; however, in our experience, the use of the gum-elastic bougie is not associated with soft tissue damage provided excessive force is not applied.

The bougie has also been found helpful in changing the ETT in patients who require prolonged endotracheal intubation. The bougie is passed through the ETT that is in place. The tube is then removed over the bougie and the new tube introduced.

Although most anesthesiologists are becoming very adept at using the fiber-optic laryngoscope for difficult intubations, in the situation where there is unexpected difficulty, we feel there should be a bougie readily available.

S. MÁIRE McCARROLL, F.F.A.R.C.S.I.
BRIAN J. LAMONT, F.F.A.R.C.S.I.
MARK R. BUCKLAND, F.F.A.R.C.S.
ALAN P. B. YATES, F.F.A.R.C.S.
Visiting Assistant Professors
Department of Anesthesiology
University of Texas Southwestern Medical Center at Dallas
5323 Harry Hines Boulevard
Dallas, Texas 75235
(Accepted for publication December 3, 1987)

Anesthesiology
68:644, 1988

The Effect of a Second Dose of Succinylcholine on Cardiac Rate and Rhythm
Following Induction of Anesthesia with Ketamine

To the Editor:—We recently reported that marked bradycardias may occur following a second dose of succinylcholine (SCh) after induction of anesthesia with midazolam or etomidate, and that the occurrence of these dysrhythmias was statistically significant after induction with etomidate.¹ We showed, in agreement with the findings of others, that the use of thiopental for anesthetic induction protects against the occurrence of such dysrythmias.²,³ The study has since been extended to define the effect of a second dose of SCh following induction of anesthesia with ketamine.

Eight ASA physical status I patients with a mean age of 35 yr (range 20–64) were studied. Approval of the Human Subjects Protection Committee at our institution and informed consent were obtained. The study protocol was the same as previously reported. Anesthesia was induced with ketamine 2 mg/kg iv. A second dose of SCh (0.5 mg/kg) was given 5 min after the first SCh injection. Paired Student’s t test was used for statistical analysis, with P < 0.05 considered to be significant.

We found that, following induction of anesthesia with ketamine, the decrease in HR after the second dose of SCh was not significant as compared with HR immediately prior to the second injection. No patient exhibited any dysrhythmias (table 1).

Ketamine produces a sympathomimetic effect primarily by direct stimulation of CNS structures.⁴ It seems reasonable to assume that the observed protective effect of ketamine against SCh-induced dysrhythmias and lack of significant decrease in HR after a second dose of SCh following induction with ketamine are due to its sympathomimetic actions.

In summary, we found that administration of a second dose of succinylcholine to healthy adult patients after induction with ketamine is safe with respect to cardiac rate and rhythm.

DANIEL H. SEARS, M.D.
Fellows in Anesthesiology
IMAD H. ABDUL-RASOOL, M.D., PH.D.
Assistant Professor of Anesthesiology
RONALD L. KATZ, M.D.
Professor and Chairman of Anesthesiology
UCLA School of Medicine
10833 Le Conte Avenue
Los Angeles, California 90024-1778

REFERENCES

(Accepted for publication December 3, 1987)

| Table 1. Effect of Second Dose of Succinylcholine on Cardiac Rate and Rhythm |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | Age (yr) | Baseline HR | HR Before 2nd SCh | Minimum HR | Rhythm After 2nd SCh |
| Ketamine        | 35 ± 15   | 78 ± 11      | 105 ± 15         | 92 ± 24     |

Values are mean ± SD; n = number of patients; HR = heart rate (bpm); SCh = succinylcholine.