

both arms after determining that blood pressure was similar in the arms measured by Dinamap®. Thirty patients were studied after carotid endarterectomy allowing comparison over a range of blood pressures much higher than in Nystrom's study. Of 558 paired measurements, 340 concerned intraarterial systolic pressures greater than 160 mmHg (table 1). Although these data generally agree with Nystrom's in the normal range, a large discrepancy appears as systolic pressure increases. Were values in this range included in Nystrom's data, a lower correlation coefficient and regression coefficient between direct and indirect pressures would have been obtained. The practicing anesthesiologist should be aware that systolic pres-

sure in the hypertensive range is significantly underestimated by the Dinamap®.

PAUL G. LOUBSER, M.B., CH.B.
*Division of Cardiovascular Anesthesia
Texas Heart Institute
Houston, Texas 77225*

REFERENCE

1. Nystrom E, Reid KH, Bennett R, Couture L, Edmonds HL Jr: A comparison of two automated indirect arterial blood pressure meters: With recordings from a radial artery catheter in anesthetized surgical patients. *ANESTHESIOLOGY* 62:526-530, 1985

(Accepted for publication June 4, 1985.)

Anesthesiology
63:567, 1985

Translaryngeal Guided Intubation Using a Sheath Stylet

To the Editor:—Every anesthetist is aware of the consequences of acute airway obstruction and should be trained to cope with this problem when it arises. However, maintaining a patent airway is not always attainable, particularly when repeated attempts at endoscopic or blind intubation have failed and have left a bloody field, preventing optimal visualization. To deal with this challenging problem, we have developed a new technique of translaryngeal guided intubation (TLI) by using a guide wire and its plastic sheath protector.

Our modified method of TLI employs the use of a spring wire originally designed to be used as a guide wire for arterial cannulation (Argon® 395203, diameter 0.021 mm, length 80 cm). After puncturing the cricothyroid membrane with a 20 GA Angiocath®, the wire is passed cephalad into the oropharynx and out the mouth or into the nasopharynx and out one of the nostrils. Instead of placing an endotracheal tube directly over the guide wire, we use the plastic sheath protector (that came with the spring wire), which was previously cut to 70 cm and straightened for easy manipulation. After the plastic sheath passes into the larynx, the spring wire is withdrawn from above to permit the sheath to be inserted deeper and to prevent possible contamination of the superficial soft neck tissues. A well-lubricated endotracheal tube then

is inserted to the desired distance using the plastic sheath as a stylet.

To date we have used this technique in six patients without failure. We believe because the sheath is small and firm, similar to an ordinary stylet that we use every day, and because the sheath is inserted over the wire it is much easier to manipulate. The only drawback of the sheath stylet is its acute curvature, which may need to be straightened before use and that sometimes require prewarming. This problem could be easily resolved if a ready-made sheath stylet was made available. Because the spring wire used is designed for intravascular use, its floppy tip will not damage laryngeal or pharyngeal structures.

The technique is generally referred to as "retrograde intubation," since the endotracheal tube is not inserted from below, although the guide wire is. We therefore have suggested that it would be more appropriate to call this technique "translaryngeal guided intubation."

HWA-KOU KING, M.D.
*Division of Anesthesiology
VA Medical Center, West Los Angeles
Los Angeles, California 90073*

(Accepted for publication June 18, 1985.)

Anesthesiology
63:567-568, 1985

Intraoperative Coronary Spasm in a Young Woman

To the Editor:—Recently, I anesthetized a 20-yr-old woman for debridement of eschars. During the procedure, the debrided areas were covered with epinephrine-

soaked sponges. A sinus tachycardia of approximately 140 beats/min ensued. I treated the tachycardia with two 0.5-mg doses of propranolol. A few minutes later, I noted an

acute elevation in ST segments. Severe bradycardia and hypotension followed. Fluids, atropine, and ephedrine did not improve the situation. Closed chest massage and epinephrine 100 μ g restored blood pressure and pulse rate. The ST segments reverted to isoelectric.

I believe this incident represents coronary spasm precipitated by the administration of propranolol. The patient had tolerated a resting pulse of 110–120 beats/min for several days before her surgery. Her pulse was 110–120 beats/min until the epinephrine was applied. Blood pressure was maintained at 90–100/50–60 mmHg throughout the two previous hours of surgery. The central venous pressure was maintained at 8–10 mmHg. A hematocrit drawn following the episode of ischemia was 30% and the potassium was 4 mEq/l.

Sudden ST segment elevation associated with hypotension and bradycardia is consistent with coronary spasm. In the anesthesia literature, 13 of 14 patients reported to have suffered coronary spasm were receiving beta blockers.^{1–3} This may represent more than just happenstance. Recently, Nussmeier and Slogoff⁴ reported a case in which they treated intraoperative tachycardia with propranolol. Acute ST elevation followed. The ischemia did not respond to nitroglycerin but was reversed with verapamil.

The cardiology literature documents exacerbation of spasm by beta blockers. Further, spasm has been associated with CaCl infusions and other interventions that promote smooth muscle contraction.

I believe that coronary artery spasm should be considered as a possible consequence of beta blockade therapy for epinephrine-induced tachycardia or for tachycardia in patients with coronary disease.

TERRY STEPHEN VITEZ, M.D.
5700 Hickam Street
Las Vegas, Nevada

REFERENCES

1. Skarvan K, Graedel E, Hasse J, Stulz P, Pfisterer M: Coronary artery spasms after coronary artery bypass surgery. *ANESTHESIOLOGY* 61:323–327, 1984
2. Boulanger M, Maille JG, Pellitier GB, Michalk S: Vasospastic angina after calcium injection. *Anesth Analg* 63:1124–1126, 1984
3. De Wolf AM, Kang YG: Coronary artery spasm and ST-segment depression. *ANESTHESIOLOGY* 62:368, 1985
4. Nussmeier NA, Slogoff S: Verapamil treatment of intraoperative coronary artery spasm. *ANESTHESIOLOGY* 62:539–541, 1985

(Accepted for publication June 21, 1985.)

Anesthesiology
63:568–569, 1985

More on Mass Spectrometers and Aerosol Propellants

To the Editor:—In our recent report,¹ we described a misleading mass spectrometer reading caused by an aerosol propellant. Chlorofluorohydrocarbon propellants are interpreted by the Perkin-Elmer® (fixed collector) mass spectrometer as isoflurane. In that report, the effect of these nonrespiratory, nonanesthetic gases was presumed due to mass spectral overlap, for which the spectral overlap erasing algorithm was not designed. With the installation of the new Perkin-Elmer® Advantage and Chemetron Sara II® systems at our institution, we performed additional *in vitro* testing with interesting results.

Metered nebulizers—alupent® (Norisodrine, Aerohalor®, Abbott Laboratories), metaproterenol sulfate (Alupent®, Boehringer Ingelheim, Ltd.), and albuterol (Ventolin®, Glaxo, Inc.)—were introduced into both systems by using 100% O₂ and then 100% N₂ as carrier gases to preclude masking spectral overlap with those gases. The findings demonstrated no differences between the carrier gases. In the Perkin-Elmer® system, clinical doses from the nebulizers (1–2 metered aerosols) were displayed uniformly as isoflurane in concentrations up to 10%. In larger doses (20–30 metered aerosols), the gases

were interpreted as up to 10% isoflurane and up to 20% CO₂. Presumably, it takes more propellant to stimulate the CO₂ collector plate. Chemetron's Sara II® system was tested identically and interpreted clinical doses of drug/propellant as up to 5% enflurane. In larger doses, the gases were interpreted as up to 5% enflurane and up to 20% CO₂.

Halogenated hydrocarbon propellants ionized by a research mass spectrometer (Finnigan MAT 4515 GS/MS®, San Jose, California) under controlled conditions yielded ions of similar mass spectra as those of all commonly employed halogenated inhalation anesthetics and CO₂. Without a specific algorithm to erase this spectral overlap, these similarities caused the erroneous interpretations. With both the Perkin-Elmer® and the Chemetron® systems, propellant at one sampling station did not affect subsequent measurements from that or other stations. Hence, these errors, lasting 4–5 s, were transient and not propagated.

This problem with propellants is not serious and certainly does not mandate that the fixed collector mass spectrometers be redesigned because hand-held inhalers