Anesthesiology
1998; 89:542

In Reply:—I completely agree with the comment made by Dr. Nakura *et al.* Measurement of the cross-sectional area using an endoscope depends on the position of the image on the fiberoptic view field, as clearly shown by the figures. Distortion of the endoscopic image is inevitable for obtaining a wide-angle view, especially for a thin endoscope. To reduce this limitation, we attempted to obtain pharyngeal images on the center of the view field, as shown by figure 2 of our article. In addition, the limitation was included in the variability of measurement of the cross-sectional area presented in the Method section. Accuracy of our cross-sectional area measurement is described in more detail in our article (Am J Respir Crit Care Med 1998; 157:1204-12). I hope that this short communication stimulates manufactures to develop new technology to solve this problem in the near future.

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(Accepted for publication April 7, 1998.)

Anesthesiology
1998; 89:542

Does Anesthesiology, Like History, Repeat Itself?

To the Editor:—In the July 1997 issue of ANESTHESIOLOGY, Robert D'Angelo and James C. Eisenach reported severe maternal hypotension (74/38 mmHg) and fetal bradycardia four minutes after intrathecal injection of 2.5 mg bupivacaine and 7.5 μg sufentanil. The authors warned the reader of the pitfalls of the combined spinal epidural technique. However, we believe that the problem is more likely related to excessive doses of the injected drugs and not to the technique.

In 1995, we showed, in an audit of 620 parturient patients, that intrathecal administration of 1 mg bupivacaine with 5 μg sufentanil epinephrine resulted in excellent analgesia in 94% of all parturient patients.[1] Motor block was not a problem. Hypotension with a systolic pressure less than 100 mmHg occurred in 24 patients (4%) but was always easily corrected, either by positioning of the mother or, in two cases, by administration of intravenous ephedrine (5 mg). Currently, we have experience with this dosage in more than 3,500 patients. Analgesia is excellent, and severe and lasting hypotension is of no concern.

We are convinced that the administration of 2.5 mg bupivacaine and 7.5 μg sufentanil is the real mischief and not the technique as such.

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Reference

1. Joos, S, Servais R, Van Steenberge A: Sequential spinal epidural analgesia for pain relief in labor. Int J Obstet Anesth 1995; 3:155-7

(Accepted for publication April 8, 1998.)

Anesthesiology
1998; 89:542-3

In Reply:—We thank Drs. Joos and Van Steenberge for their thoughtful reading of our case report and congratulate them on their continued dedication to the field of obstetric anesthesia and their continued refinements to make it more safe and effective. They raise several important tenets of labor analgesia and uncover some important uncertainties. First, one clearly should use the lowest effective dose of intraspinal agent. As they nicely discuss, there has been a steady decrease in the concentration and dose of epidural bupivacaine used in obstetric analgesia, and although many consider bupivacaine, 0.125%, plus opioid an overdose, we agree with our European colleagues that lower concentrations are not routinely effective.

The lowest effective dose of intrathecal sufentanil alone or with bupivacaine is not known. Although initial studies used 10-15 μg sufentanil, lower doses (5-7.5 μg) are being used. Few dose-response data exist, and those that have been recently published show a very flat dose-response, perhaps reflecting a wide variability in response as labor progresses.

Whereas we are clearly in favor of combining α-2-adrenergic agonists, local anesthetics, and opioids for spinal analgesia, there are virtually no systematic data that show the "best ratio" of epinephrine, bupivacaine, and sufentanil for labor analgesia. We use sufentanil (7.5 μg) plus bupivacaine (2.5 mg) as a combination that has been described and that produces a reasonable period of analgesia in early and late labor. Whether lower doses would be equally effective for similar durations of time is not known. To suggest that the concoction used at our colleagues' institutions represents the

"required effective but also safe dosage" is unsubstantiated, their audit not withstanding.

We disagree that the dose administered in our case represents an overdose. Rather, we agree entirely with Drs. Joos and Van Steenberge that vigilance and refinements of dose are essential to safe and effective treatment of labor pain.

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Anesthesiology
1998; 89:543

Is Your Pulmonary Artery Catheter Shedding?

To the Editor: — Recently we used a Baxter Swan-Ganz Continuous Cardiac Output/Oximetry/Venous Infusion Port (CCO/SvO2/VIP) Thermodilution Catheter Model 746H8F (8 French, 110 cm; Baxter Healthcare Corp., Irvine, CA) during cardiac transplantation surgery. After *in vitro* calibration, the catheter was removed from its package and inserted through a sterile Arrow Twist-Lock Cath-Gard Catheter Contamination Shield Model ST-09875 (80 cm; Arrow International Inc., Reading, PA), recommended for use with 7.5- to 8-French catheters. During flushing of the ports and testing of the balloon, we recognized what appeared to be a tiny shred of clear plastic wrap, approximately 1 mm × 2 mm, partially attached to the catheter in the thermal filament area. When we tried to remove this little shred, a strip of clear plastic, approximately 1 mm × 70 mm, came off of the catheter. Careful inspection did not show any damage to the catheter, and the coating of the thermal filament seemed to be intact. We believed that we had removed a piece of surplus plastic and decided to use the catheter. It was introduced through an Arrow-Flex Percutaneous Sheath Model EU-09903-S (9 French, 10 cm) without difficulty and, once in place, the pressure, cardiac output, and oximetry readings were in the expected range. During cardiopulmonary bypass, when the surgeon opened the right atrium, he found a piece of clear plastic approximately 5 × 70 mm hanging off the catheter (figure 1). The tubular shape of this piece indicated that it was the plastic coating of the thermal filament. We removed the Swan-Ganz catheter; the thermal filament area was without coating and with some blood adhesions in this now uncovered area.

The catheter was removed from an undamaged package without problem; it seems unlikely that it was damaged at this time. The tiny shred of plastic was seen when we inspected the catheter before insertion, after it had been threaded through the Arrow Twist-Lock Cath-Gard. The plastic coating of the thermal filament, an area less flexible and slightly thicker appearing than the remaining part of the pulmonary artery catheter, appears to have been damaged in passage through the inlet or outlet of the Arrow Twist-Lock Cath-Gard. Despite the finding that no damage was visible in the plastic coating after removal of the loosened strip, either we failed to see the flaw or we disrupted the coating such that it peeled off when exposed to the bloodstream. If the piece of plastic had come off the catheter, it would probably have embolized to the pulmonary vasculature.

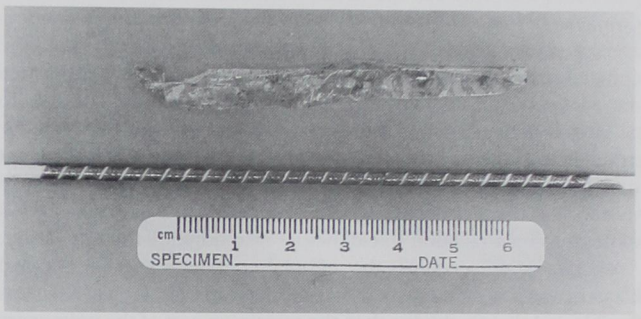

Fig. 1. Shown above the scale are the thermal filament area of the pulmonary artery catheter and the peeled off plastic coating found in the right atrium.

We would like to bring to the attention of the reader that continuous cardiac output catheters must be threaded with caution through protective sheaths, and the plastic coating of the thermal filament then must be carefully examined for damage. If there is any visible disruption of the plastic coating, the catheter should be discarded. Although protective sheaths are a known source for damage to the balloon, their potential for damaging the pulmonary artery catheter coating must be recognized.

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(Accepted for publication April 24, 1998.)