represent a maximal stimulus, and may not be completely comparable to the same duration occlusion applied during a state of higher myocardial oxygen consumption. For this reason, we chose to measure coronary reserve pharmacologically, using adenosine, which ensured that we could attain maximal coronary vasodilation in each case.

In summary, because of the literature indicating that coronary vascular reserve is dependent on the pressure at which it is measured, we felt it necessary to make our comparisons of reserve at the same resting coronary pressure in all experimental conditions. Using a diastolic coronary pressure of 40 mmHg allowed us to obtain reserve measurements in all animals under all anesthetic conditions. Use of this diastolic pressure was, furthermore, appropriate, as this pressure was within the autoregulatory range in these dogs. When absolute numbers for coronary vascular reserve were used, the differences between awake and anesthetized animals were small and not statistically significant, despite lower heart rates in the halothane-anesthetized animals. A difference can be found if ratios of peak and resting CBF are used instead of absolute data. Although not a settled issue, we would favor use of absolute data whenever possible, particularly when "reserve" is changed by alterations of baseline coronary blood flow, rather than by diminished peak coronary flow.

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Management of an Intravascular Epidural Catheter

To the Editor:—When an epidural catheter is inadvertently introduced into an epidural vein, the recommended management is to remove the catheter from the epidural space and reinsert it *via* an adjacent interspace.[1] The obese or uncooperative patient, for example, presents a problem where the primary insertion of the needle or catheter may be difficult, only to enter an epidural vein. The use of our technique on ten obstetric patients has salvaged the initial insertion of the epidural catheter.

Over the course of time, ten patients in whom an intravascular insertion of an epidural catheter occured were treated in the following way. Using an 18-gauge Hustead needle and a loss-of-resistance technique with saline and a glass syringe, 2–3 ml of saline is injected upon entrance into the epidural space.[2] The catheter is introduced through the needle approximately 5 cm into the epidural space. The needle is removed. If blood is easily aspirated from the catheter, preservative-free saline is injected to clear the catheter. The catheter is then withdrawn a small distance, approximately ½ cm. This process is repeated until blood can no longer be aspirated. If the markings on the catheter relative to the skin indicate the catheter is still in the epidural space, a routine test dose (3 ml of xylocaine 2% with 1:200,000 epinephrine) is administered to confirm that the catheter is indeed extravascular.[3,4] We recognize that blood aspirated from an epidural catheter may come from an injured vein and that the catheter may not actually be intravascular.

This technique has proved useful in patients in whom insertion of the epidural catheter has been difficult. In none of the patients has the test dose confirmed an intravascular injection, and all subsequent injections were followed by adequate epidural analgesia. We feel this technique offers an alternative to repeating insertion of the epidural catheter at a second interspace, and may be advantageous in the patient in whom the insertion of the first catheter was technically difficult.

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