

TABLE 1. Effect of Different Adhesives on Reduction of Shock Wave Pressure

Material Tested	Results
None (control)	1200 bars of shock wave force
2-cm thick Styrofoam block	No reading, shock wave completely blocked
Foam adhesive tape (Microfoam®, 3M)	200 bars, reduction of 1000 bars of shock wave force
Regular cloth adhesive tape	1000 bars, reduction of 200 bars of shock wave force
Hy-tape® (Pink tape) (Hy-tape Surgical Hosiery Co.)	1200 bars, no reduction of shock wave force
Op-Site®, Smith and Nephew Company	1100 bars, reduction of 100 bars of shock wave force
Base line reading at completion (control)	1200 bars of shock wave force

not only responsible for the high failure rate to crush the stones, but also made the use of epidural fentanyl highly successful in those patients. A 2-cm thick Styrofoam block completely absorbs the force of the shock wave. The Hytape® (pink tape) and the Op Site® do not significantly obstruct the force of the shockwave. Thus, the results of our study with epidural fentanyl presented at the 1987 meeting of the American Society of Anesthesiologists are invalid, and this correspondence serves as a disclaimer. Our Urology Department was able to trace 92 patients who were treated with ESWL with the foam tape applied to their backs; 33 had complete stone fragmentation, 25 had partial but inadequate fragmen-

tation, and 34 had little or no discernable fragmentation.

Based on our experience and study, we recommend that any material containing air (like adhesive foam tape) should not be applied in the path of the shockwave during ESWL. Air bubbles introduced into the epidural space (during determination of loss of resistance) may also attenuate the shockwaves.

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#### REFERENCE

1. Pandit SK, Powell RB, Crider B, McLaren ID, Rutter T: Epidural fentanyl: A simple and novel approach to anesthetic management for extracorporeal shock wave lithotripsy (ESWL) (abstract). *ANESTHESIOLOGY* 67:A225, 1987

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### Sinus Node Exit Block following Administration of Vecuronium

*To the Editor:*—Vecuronium is widely used to provide skeletal muscle relaxation during surgery and in the mechanically ventilated ICU patient. The absence of significant cardiovascular side effects is one of its stated advantages. There have been isolated reports of bradydysrhythmias, including sinus arrest, when vecuronium was administered in concert with other agents during anesthetic induction and maintenance.<sup>1-4</sup> To our knowledge, there are no reports of cardiovascular complications associated with the administration of vecuronium alone.

We wish to report the development of sinus node exit block following the administration of vecuronium to a patient in the Intensive Care Unit.

A 14-yr-old boy was admitted for management of a

closed head injury and ocular laceration sustained in a motor vehicle accident. The left eye was enucleated on the first hospital day. The following day, vecuronium 0.08 mg/kg iv was used on two occasions 6 h apart, to facilitate the performance of noninvasive radiographic studies. Approximately 5 min after each administration, several episodes of sinus node exit block were observed on the ECG monitor (fig. 1). The rhythm was tolerated without change in blood pressure and resolved spontaneously within a few minutes on both occasions.

The patient had been mechanically ventilated since his admission and had remained hemodynamically stable. There was no history of cardiac disease. Serum electrolytes and arterial blood gases were normal. He was receiving oxacillin, dexamethaxone, phenytoin so-

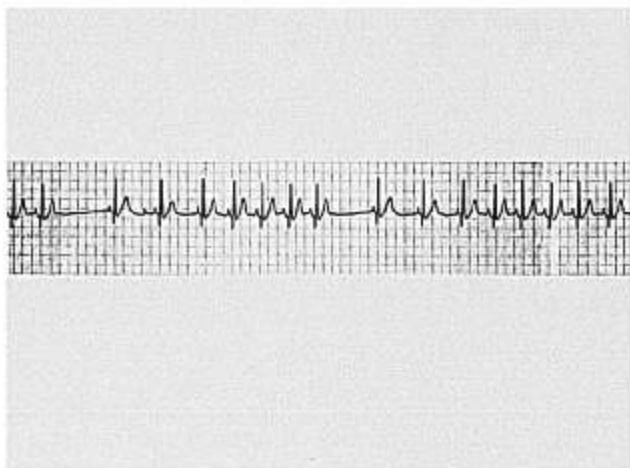


FIG. 1. Recurrent sinus node exit block on a continuous ECG recording following vecuronium bromide administration.

dium, and cimetidine. Lorezapam 3 mg iv had been given 2 h before the first dose of vecuronium; no other sedative was used during this time period.

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To recognize this potential complication of vecuronium bromide may be important in patients with abnormal sinus node function, sick sinus syndrome, and those patients receiving medications known to affect cardiac automaticity and conduction.

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#### REFERENCES

1. May JR: Vecuronium and bradycardia. *Anaesthesia* 40:710, 1985
2. Milligan KR, Beers HT: Vecuronium-associated cardiac arrest. *Anaesthesia* 40:385, 1985
3. Kirkwood I, Duckworth RA: An unusual case of sinus arrest. *Br J Anaesth* 55:1273, 1983
4. Cozantitis DA, Poult J, Rosenberg PH: Bradycardia associated with the use of vecuronium. A comparative study with pancuronium with and without glycopyrronium. *Anaesthesia* 42:192-194, 1987

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### Should Multiorifaced Central Venous Catheters be Heparin Bonded?

*To the Editor:*—Multiorifaced catheters placed at the junction of the superior vena cava with the right atrium have been demonstrated both in a Silastic® atrial model<sup>1</sup> and an experimental animal model<sup>2</sup> to improve the recovery of air following venous embolism (VAE). Two different manufacturers' models of these catheters are in use at our institution (Bunegin-Albin Air Aspiration Set, CVAE-580, Cook Inc., Bloomington, IN; Antecubital Catheterization Kit, AK-04250, Arrow, Reading, PA). Occasionally, the catheter is removed when the patient arrives in the recovery room. When this has been done, it has been noted that, in many instances, the catheter appears to be clotted despite apparent adequate intraoperative function as reflected by a good central venous pressure (CVP) waveform. Since this was first noted, we have made a practice of injecting fluid through the catheter at the time of removal to determine its patency. Of the 20 catheters so far examined, we have found that, in 14 (70%), fluid escaped from only the most proximal orifice, the other orifices being obstructed by clot (fig. 1). Four of the 20 catheters (20%) were completely patent and, in 2 (10%), the proximal two or three orifices were patent.

The duration of the cases involved ranged from 4-8 h. In most cases, the catheter was used to monitor CVP

for the majority of the case, so that only a slow transducer flush (3 ml/h) of heparinized saline with an occasional rapid flush was infused through the catheter. However, in four cases, the CVP catheter was also used for slow fluid infusion. Of these four catheters, only one was completely patent. Eighteen of the 20 catheters had

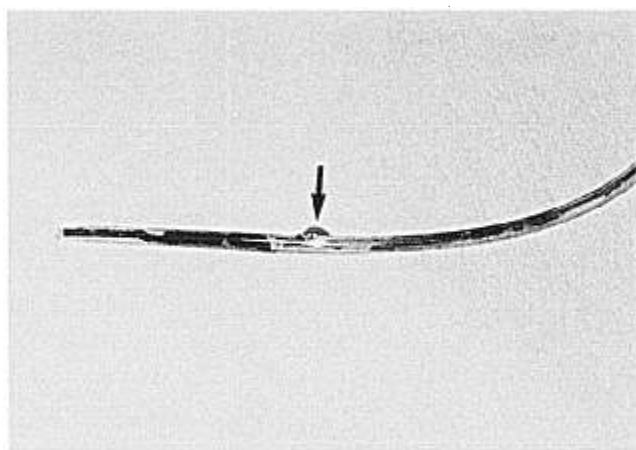


FIG. 1. Fluid injected into the proximal opening of the multi-orifaced catheter escapes only from the proximal orifice (arrow); the other orifices are occluded.