

formed a systemic analysis in 16 adult mongrel dogs to determine the origin of the lumbar cerebrospinal fluid pulse wave. The descending thoracic aorta was occluded to evaluate the effects of the spinal arterial pulsations, and the thoracic aorta and inferior vena cava were simultaneously occluded to evaluate the effects of the spinal venous pulsations. It was concluded that, in the first harmonic wave, the components of the lumbar cerebrospinal fluid pulse wave are as follows: spinal arterial pulsations, 39.4%; spinal vascular (arteries and veins) pulsations, 77%; venous pulsations in the spinal canal, 37.6%; and the intracranial pressure pulse wave transmitted through the spinal canal from the intracranial space to the lumbar level, 23%. From this investigation we learn that 77% of the lumbar cerebrospinal fluid pulse wave that is directly transmitted to the extradural space as an extradural pressure wave is originated in the vascular system (arteries and veins), and not in the brain. So, any rise in the blood pressure, which is not an infrequent occurrence during epidural needle insertion, can cause a concomitant rise in the epidural pressure, with loss of the "negative" pressure in the extradural space, resulting in an "unreliable" hanging drop and Macintosh balloon indicator techniques.

Joseph Eldor, M.D.  
 Department of Anesthesia  
 Misgav Ladach General Hospital  
 Jerusalem, Israel

## References

1. Shah JL. Positive lumbar extradural space pressure. *Br J Anaesth* 1994; 73: 309-314.
2. Eldor J, Guedj P. Combined hanging drop—loss of resistance technique for identification of the epidural space. *Reg Anesth* 1991; 16: 299-300.
3. Hirai O, Handa H, Ishikawa M. Intracranial pressure pulse waveform: considerations about its origin and methods of estimating intracranial pressure dynamics. *Brain Nerve (Tokyo)* 1982; 34: 1059-1065.
4. Urayama K. Origin of lumbar cerebrospinal fluid pulse wave. *Spine* 1994; 19: 441-445.

Accepted for publication November 27, 1994.

## Treatment of Supraventricular Tachycardia Under Spinal Anesthesia

### To the Editor:

We would like to respond to comments made by Valley and Herman<sup>1</sup> with regard to our case report "Supraventricular Tachycardia in a Parturient Under Spinal Anesthesia,"<sup>2</sup> in which we described the successful use of phenylephrine to treat an episode of paroxysmal supraventricular tachycardia (PSVT) occurring under spinal anesthesia.

We agree that 24- to 48-hour Holter monitoring is a very useful method for assessing a patient with a history

of palpitations. Although not mentioned in our case report, the fetal heart rate was monitored continuously for the duration of anesthesia and was normal throughout, including the episode of hypotension.

There is no evidence that the use of phenylephrine (to terminate PSVT in pregnancy) is associated with a decrease in uterine blood flow in humans, and there is no foundation to Valley and Herman's concern that our technique may result in significant maternal and fetal morbidity. Finally, we believe that the use of direct-current cardioversion while a patient is conscious and unsedated may lead to considerable distress and is not to be recommended.

The aim of our case report was to bring attention to the possibility of using phenylephrine for the termination of PSVT occurring during spinal anesthesia. Valley and Herman appear to be particularly concerned that our method might be accepted by practicing anesthesiologists as standard. Clearly, such changes in practice cannot be made on the basis of a single case report, and we have not been so dogmatic as to recommend phenylephrine as the treatment of choice in this situation.

Often, case reports are of interest just because they describe methods that are not standard and thereby stimulate further discussion or research. Therefore, we are grateful for the interest expressed by Valley and Herman in our case report but feel their concern is unwarranted.

Noor M. Gajraj, F.R.C.A.  
 Donald H. Wallace, M.D.

Department of Anesthesiology and Pain Management  
 University of Texas Southwestern Medical Center  
 Dallas, Texas

## References

1. Valley MA, Herman NL. Response to supraventricular tachycardia in a parturient under spinal anesthesia. *Reg Anesth* 1994; 19: 150-151.
2. Gajraj NM, Pace NA, Wallace DH. Supraventricular tachycardia in a parturient under spinal anesthesia. *Reg Anesth* 1993; 18: 261-263.

Accepted for publication January 14, 1995.

## Comment on Anesthesia Technique Described by Eldor

### To the Editor:

Recently Dr. Eldor described a case report using combined spinal-epidural-general anesthesia in a woman scheduled for myomectomy.<sup>1</sup> He appears to be enthusiastic about this combination, even writing about a new type of anesthesia, commenting on the benefits—"getting the best out of three techniques and leaving the "bad things" out.

I disagree with him for a number of reasons. Above all, I firmly believe that there is no such thing as combining only

the benefits and not the drawbacks when using different techniques at the same time. While the combination of techniques may offer certain benefits otherwise unattainable, each technique has its own disadvantages and they do not simply disappear by combining techniques.

The past years have shown a growing interest in the combination of spinal and epidural anesthesia. Those in favor point out the benefits; that is, the intensity and speed of onset of spinal anesthesia combined with the possibility of epidural reinforcement and postoperative epidural pain relief. Being aware of going against the present tidal wave, it is my opinion that the combined spinal-epidural technique does not have that much to offer, and, on the contrary, combines the disadvantages of the two techniques involved. It is not my intention to discredit those who practice combined spinal-epidural anesthesia; the fact is that just because something is new and possible does not necessarily mean that it is also good. Looking closely at the available literature, I cannot think of any operation performed under combined spinal-epidural anesthesia that could not be done just as well with a properly functioning spinal or epidural anesthesia alone.

Considering the case described by Dr. Eldor, I fail to understand his enthusiasm. Obviously, general anesthesia was not planned at the beginning of the operation, but became a necessity due merely to an unforeseen turn of events. This would also have happened had he started with spinal anesthesia or with epidural anesthesia. In the case Dr. Eldor presented, spinal anesthesia was satisfactory. Before the institution of general anesthesia, 2 mL of 0.5% bupivacaine was injected through the epidural catheter. Does he seriously believe that this amount in the epidural space causes any significant improvement of what he already had—apparently satisfactory spinal anesthesia for lower abdominal surgery? He specifically states that the epidural catheter was not to be used for postoperative pain relief but was to be removed after the operation. So what benefit did the epidural catheter offer?

As anesthesiologists, we are all aware of the benefits of combining epidural and general anesthesia. Unfortunately, we are also familiar with the fact that due to unforeseen events, we sometimes have to supplement a planned regional anesthesia with an unplanned general anesthesia. In my opinion, the latter happened to Dr. Eldor; I do not think we are dealing with a new technique.

Rudolf Stienstra, M.D., Ph.D.  
Department of Anesthesiology  
University Hospital Leiden  
Leiden, the Netherlands

#### Reference

- Eldor J. Combined spinal-epidural-general anesthesia. *Reg Anesth* 1994; 19: 365–366.

## Aseptic Meningitis Due to Metallic Particles in the Needle-through-needle Technique

### To the Editor:

Harding et al.<sup>1</sup> have described recently two cases of meningitis occurring after combined spinal-epidural anesthesia done by the needle-through-needle technique. In both cases, they introduced a long 27-gauge Whitacre spinal needle through a Tuohy needle for the subarachnoid injection, and then introduced an epidural catheter through the Tuohy needle, after withdrawing the Whitacre needle. They claimed that in the first case, "the most likely source of contaminant was chlorhexidine spirit solution used for skin preparation." They state also that "a change in our standard practice has resulted following this case, whereby skin preparation is applied remote from the extradural trolley and is not allowed to contaminate needles or catheters." In the second case, they blamed the blood patch for introducing *Staphylococcus epidermidis* typical of a community skin commensal.<sup>2</sup>

We suggest another explanation for the etiology of the aseptic meningitis in these patients: aseptic meningitis due to metallic particles produced by the needle-through-needle technique for combined spinal-epidural anesthesia. The details of this theory were described in several letters.<sup>3,4</sup> In our opinion these two cases are the first reported cases of this phenomenon. While pushing the spinal needle through the bent epidural needle, there is a production of micrometallic particles due to the friction when one metal rubs the other forcefully. Then the epidural catheter, which is inserted through the epidural needle after withdrawing the spinal needle from its lumen, pushes these micrometallic particles further into the epidural space. The anesthesiologist using the needle-through-needle technique for the combined spinal-epidural anaesthesia exposes the patient to two possible risks: aseptic meningitis and the possibility of carcinogenic material. While the latter possibility seems more theoretic than real, the question needs to be considered.

Joseph Eldor, M.D.  
Pierre Guedj, M.D.  
Department of Anesthesia  
Misgav Ladach General Hospital  
Jerusalem, Israel

### References

- Harding SA, Collis RE, Morgan BM. Meningitis after combined spinal-extradural anaesthesia in obstetrics. *Br J Anaesth* 1994; 73: 545–547.
- Eldor J. Metallic particles in the spinal-epidural needle technique. *Reg Anaesth* 1994; 19: 219–220.
- Eldor J, Brodsky V. Danger of metallic particles in the spinal-epidural spaces using the needle-through-needle approach. *Acta Anaesthesiol Scand* 1991; 35: 461.
- Eldor J. Metallic fragments and the combined spinal-extradural technique. *Br J Anaesth* 1993; 69: 663.
- Costa M. Molecular mechanisms of nickel carcinogenesis. *Annu Rev Pharmacol Toxicol* 1991; 31: 321–337.