

## REFERENCES

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## REPLY

I am not sure what an "unnecessarily large volume of air" means as very small bubbles caused unblocked segments in the patients described by Dalens *et al.*<sup>1</sup> Since we have been using the technique of saline and air in the same syringe, as described by Wait,<sup>2</sup> the problem of unblocked segments is almost non-existent in our practice.

There can be no doubt that (a) the aspirated fluid was CSF (Table). Catheter migration is today a very well documented and widely accepted entity.<sup>3-5</sup> Thus, I believe that the behaviour of the block was due to pressure differences at different anatomical sites and locations in the catheter following subarachnoid migration of the distal part of the catheter.

During the application of negative pressure to the aspirating syringe, CSF entered the catheter. When using multihole epidural catheters, Power and Thorburn<sup>6</sup> demonstrated that flow is present at the proximal hole at low pressures, and appears at the middle and distal holes at higher pressures. They also proved the hypothesis that the pressure used to inject local anaesthetics during an epidural topup produces a differential flow from the holes in a multihole catheter. When multihole catheters are passed partially through the dura and arachnoid, the character of the blockade is determined by the differential exit flows from the three holes in the catheter. A slow rate of injection (which was used as we fractionated the local anaesthetic agent in 2 ml increments) will give an epidural block when the local anaesthetic exits from the catheter through the proximal hole. A more rapid rate of injection will cause a portion of the agent to enter the CSF through the distal hole causing a subarachnoid block.

Thus, I respectfully disagree with Dr. Meiklejohn. This was not a "completely normal epidural." The end result of the epidural turned out to appear completely normal because the

safety precautions of epidural anaesthesia were carefully adhered to.

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- 5 Abouleish E, Goldstein M. Migration of an extradural catheter into the subdural space. A case report. *Br J Anaesth* 1986; 58: 1194-7.
- 6 Power I, Thorburn J. Differential flow from multihole epidural catheters. *Anaesthesia* 1988; 43: 876-8.

We regret that Fig 1b in the original letter was printed upside down. Editor.

## Surgery in Jehovah's Witnesses

To the Editor:

We have read Wong and Jenkins' Surgery in Jehovah's Witnesses<sup>1</sup> with interest. Much of the advice is sensible and well-balanced. However, we beg to disagree with their conclusion that "the surgeon and the anaesthetist" should "take the challenge" and accept that "the religious beliefs of Jehovah's Witnesses should be respected." This one-way traffic in respect of personal conviction pays no credence to the religious, or other, beliefs of the surgeon and anaesthetist.

We have decided that we will no longer administer an anaesthetic for surgery in a Jehovah's Witness who refuses to accept our belief that administration of blood products may be necessary to sustain that patient's life. We will, however, assist the surgeon to find another anaesthetist whose beliefs accord with the Jehovah's Witness. Anaesthetists find challenge enough in the attempt to provide safe anaesthesia without additional risks being imposed by the patient.

A recent experience of having to allow a previously healthy, young, Jehovah's Witness to die on the operating table, as the result of unfortunate surgical bleeding after elective surgery which caused the haemoglobin concentration to fall to  $9.0 \text{ g} \cdot \text{L}^{-1}$  is not an occurrence which we

TABLE

	First aspirate	Second aspirate
Volume (ml)	1.2	1.0
Appearance	Clear	Clear
Colour	Clear	Clear
Turbidity	Nil	Nil
Clotting	Nil	Nil
Protein ( $\text{g}^{-1}$ )	0.35	0.30
Glucose ( $\text{mmol}^{-1}$ )	3.1	2.9
Chloride ( $\text{mmol}^{-1}$ )	132	134
White blood cells	Nil	Nil
Red blood cells	Occasional	Occasional