Summer in San Diego, or failed spinal anesthesia: Chemical versus technical phenomenon?

Été à San Diego ou échec de rachianesthésie : phénomène chimique versus technique ?

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Single dose spinal anesthesia with hyperbaric bupivacaine combined with a small dose of an opioid (either fentanyl or sufentanil) is a technique widely popular today in the practice of clinical anesthesia [1]. It usually produces rapid onset and predictable (high) quality anesthesia, yet occasionally fails for no apparent reasons [2]. Although technical problems seem to account for the majority of the spinal block failures, cases in which the technique appeared to have been flawless, have been reported [2,3]. Hoppe and Popham [2] reported on four cases of seemingly inexplicable complete failure of single dose spinal anesthesia and concluded that possible (and most common) causes of spinal block failure include anatomical abnormality, drug (potency) failure and management failure. At the University of California in San Diego, California, in the summer of 2006 we encountered several unexplained cases of complete failure of spinal anesthesia in both obstetric (C. Albano – personal communication) and nonobstetric (L. Rivera – personal communication) patients where technique (confirmation of the correct needle placement) appeared to have been perfect. We speculated that the failed spinal block in each of these patients might have been a chemical rather than a technical phenomenon.

Interestingly, the US Food and Drug Administration (FDA) states that bupivacaine is “heat intolerant”, and shipment of this drug during (hot) summer months may lead to (some) loss of potency [4]. Additionally, the product insert states that bupivacaine “solutions should be stored at controlled room temperature 15–30 °C.” In a recent study, Soens et al. [4] investigated whether exposure of 0.75% hyperbaric bupivacaine to extreme temperatures could alter its concentrations. And indeed, the authors concluded that concentrations of bupivacaine (heated versus cooled) might change (e.g., room temperature bupivacaine had an average concentration of 6.9 mg/ml, cooled bupivacaine had an average concentration of 6.1 mg/ml, and heated bupivacaine had an average concentration of 6.4 mg/ml). However, Soens et al. [4] acknowledged that their study was not adequately powered and the clinical significance of their findings was not evaluated.

References