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68:317, 1988

Selective Block of the Nerves of the Brachial Plexus

To the Editor—I read with interest the article by Partridge et al. and the accompanying editorial concerning
axillary block.

Unfortunately, the article describing the anatomy of the brachial plexus in 18 cadavers does not mention the
musculocutaneous nerve. Clinicians are aware that blockade of this nerve is frequently missed in single
injection techniques. One way to make certain of anesthetizing the musculocutaneous nerve or any other nerve
in the axilla is to selectively stimulate that nerve. Although the editorial mentions the possibility of lesions to the nerves with paresthetic techniques, we have used peripheral nerve stimulation with insulated pin-type point needles for many years, and this may be an answer to this problem.

RENÉ MARTIN, M.D.
Department of Anesthesia
Université de Sherbrooke

Centre Hospitalier Universitaire de Sherbrooke
Sherbrooke, Quebec, Canada J1H 5N4

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In Reply.—We appreciate Dr. Martin’s interest in our
study. Dr. Martin is, of course, correct in noting that we did not include the musculocutaneous nerve in our
study. As he points out, the musculocutaneous nerve exits the neurovascular bundle prior to the point at
which the brachial plexus sheath enters the axilla, so its distribution is not relevant to the questions of whether
there are functional septa within the sheath, or whether single injections within the sheath contact all the nerves
lying within it.

Efforts to anesthetize the musculocutaneous nerve have included separate injections outside the axillary
sheath, into the coracobrachialis muscle, and techniques to extend proximal flow of drug injected into the
axillary sheath. As we discussed in our article, we were not certain that proximal flow would be the same in cadavers as in living patients, and so did not examine this. In addition, as Dr. Martin suggests, a number of authors have previously suggested using nerve stimula-
tors to locate nerves for peripheral nerve blocks. As far as we are aware, however, no published study has
demonstrated that success rates for axillary blocks are higher with this technique than with the others we
discussed. We still believe that individual experience with a particular technique is probably the most important
indicator of success with brachial plexus anesthesia.

B. L. PARTRIDGE, M.D., D.PHIL.
J. KATZ, M.D.
Department of Anesthesiology

K. BENIRSCHKE, M.D.
Departments of Pathology and Reproductive Medicine
University of California, San Diego
San Diego, California 92103

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Does Halothane Protect Against Hypoxia?

To the Editor:—Hershenson et al. confirmed a previous investigation that halothane significantly reduces cardiac output and oxygen consumption in normoxic and hypoxic newborn lambs when compared to paralyzed, ventilated controls. They conclude that halothane reduces oxygen consumption and delivery, and may be protective in hypoxic patients. One must exercise caution in interpreting these results because of two serious design flaws in this study. Hershenson et al. used paralyzed newborn lambs that were anesthetized with fentanyl (30 μg·kg⁻¹·hr⁻¹) as their control animals. Fentanyl may not be an “anesthetic” in newborn lambs at ten to 100 times this dose. Indeed, the ability of fentanyl to anesthetize other species at this dose has been questioned as well. We wonder how this may have affected the author’s conclusions. Were the decreases seen in oxygen consumption and delivery the result of halothane per se, or secondary to the reduction of an artificially elevated oxygen consumption and delivery caused by pain or immobilization stress? Perhaps any anesthetic agent would produce the same results.

Secondly, all animals were exposed to progressively lower levels of inspired oxygen (100%, 21%, 15%, 10%) in this study without either an intervening return to normoxia or randomization of the sequence of exposure. Were the decreases in oxygen consumption and delivery at the 10% FIO2 level unduly influenced or exaggerated by the immediately preceding hypoxic exposure?

MYRON YASTER, M.D.
Assistant Professor
Anesthesiology/Critical Care Medicine and Pediatrics
The Johns Hopkins Hospital
Baltimore, Maryland 21205

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In Reply:—We welcome and appreciate Dr. Yaster’s comments concerning experimental design. With regards to the use of fentanyl, we agree that fentanyl alone may not provide surgical anesthesia in the newborn lamb. We have found that paralyzed animals given fentanyl alone at 30 μg·kg⁻¹·hr⁻¹, while able to lie on the operating table without restraint and appearing to have a blunted response to stimulation, continued