In Reply.—We appreciate the interest of de Jong et al. in the difficulties of calibration using oscillography. Oscillometric blood pressure measurement provides, in descending order of accuracy, estimates of mean, systolic, and diastolic pressures. To determine a gain factor and offset to apply to the piezoresistive measurement using oscillography, there are three degrees of freedom: mean, systolic, and diastolic. To determine two variables (gain and offset), with this additional degree of freedom, infinite calibration rules can be created. One rule is to consider the difference between systolic and diastolic pressure for calculating the gain. This method may be problematic because it combines the errors in the two measures most subject to inaccuracies. A linear calibration using only the mean and systolic measures might be proposed as possibly less subject to noise because the diastolic measurement may add more incremental noise than information. A quadratic calibration formula might be proposed because it would use the extra degree of freedom. Given these possibilities, we chose to simply correct for the offset in mean pressure alone, and in our study, we considered only mean pressure because it is the least error-prone. Oscillometric calibration is the major source of disagreement between measurements of blood pressure determined using arterial tonometry and intraarterial measurement. Further investigation may permit the improvement of calibration using oscillography.

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Precurved Transtracheal Catheters

To the Editor.—At the conclusion of their paper concerning kinking of transtracheal catheters,1 Sdralis and Benumof state that “…continuously precurved [transtracheal jet ventilation] catheters may be commercially available soon…” In fact, a precurved transtracheal catheter designed by Ravussin and Freeman has been manufactured by VBM Medizintechnik, Germany, since 19852 and is available in the United States from International Medical Development, Park City, Utah.

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References

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Neurotoxicity of Contrast Agents: I

To the Editor.—Karl et al.1 report a case of focal seizures after intraoperative visualization of a cervical syringoperitoneal shunt with diatrizoate meglumine (Renografin or Hypaque), a water-soluble ionic contrast agent. When my colleagues and I published a similar near catastrophe in 1970,2 there were few clinical reports in the literature. Twenty-four years later, it is remarkable that this avoidable complication still occurs.

An important detail missing from their case report is the identity

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of whom injected the diatrizoate into the shunt intraoperatively. Was it the anesthesiologist, the surgeon, the radiologist, or someone else? This question is not asked to assign fault but rather to identify the most appropriate procedures for preventing future mishaps. With our case, the diatrizoate was injected by a radiologist who was unaware of the possible neurotoxic complications.

The authors mention that a radiologist performed a preoperative computed axial tomography scan and visualized the shunt with iohexol (Omnipaque), a nonionic, low-osmolality contrast agent, an appropriate choice for this intrathecal injection. This aspect of the case emphasizes their inappropriate use of diatrizoate intraoperatively and supports their recommendation for the establishment of a protocol for the use of radiographic contrast agents in the operating rooms. However, even the most detailed protocol must be accompanied by increased awareness about the neurotoxicity of all contrast agents and, particularly, the neurotoxicity of the ionic contrast agents.

Anesthesiologists are trained to be cautious when contemplating the injection into an artery of a drug that otherwise would be well tolerated when injected into a vein. Anesthesiologists also should be wary when injecting any substance through a catheter that violates the blood-brain barrier, depositing the substance intrathecally. Should an anesthesiologist, a surgeon, or a radiologist inject radiographic contrast media—only if the anesthesiologist, surgeon, or radiologist is familiar with the compound and its consequences.

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References


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Neurotoxicity of Contrast Agents: II

To the Editor:—Karl et al. are to be congratulated on the prompt recognition and treatment of the reaction to the subarachnoid injection of the radiologic contrast agent diatrizoate meglumine (Hypaque) intraoperatively. As the authors state, mortality from this drug injection is about 50%. The syndrome resulting from the subarachnoid injection of ionic (and sometimes nonionic) contrast agents often is referred to as the ascending, ionic/clinic seizure syndrome. As also stated, but not documented in this case, rhabdomyolysis, fever, and DIC may complicate the reaction. Some years ago, a patient was referred to our malignant hyperthermia biopsy center because he experienced a similar reaction, and the question of malignant hyperthermia was raised. As Ong and I reported, the patient was not found to be malignant hyperthermia-susceptible.

Other cases of this reaction have been reported directly to the drug manufacturer. It seems that the common denominator in such cases is the migration of the dye into the cerebral ventricles.

Supportive treatment is most effective because the syndrome appears to be self-limited, although this is as yet a conjecture. On occasion, dantrolene has been used to treat the hypertonicity and fever. It is not clear whether the response to dantrolene is specific, because other therapy often is administered concomitantly. This is another example of a rare reaction to a drug that is sometimes administered during surgery or for which the anesthesiologist is consulted and that may be fatal if not promptly recognized. Reporting of such cases in the medical literature and to the Food and Drug Administration is to be encouraged.

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References


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