wall. This justifies monitoring the intracuff pressure and limiting this pressure to 60 cm H_20^2 or to the "just seal pressure."[3]

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Anesthesia-related Deaths during Obstetric Delivery in the United States. 1979–1990

To the Editor:—In their recent article on anesthesia-related deaths during obstetrical delivery in the United States, Hawkins *et al.*[1] compare case fatality and risk ratios for cesarean delivery during general anesthesia with those during regional anesthesia. The authors describe a significant downward trend in the death rate for cesarean delivery during regional anesthesia after 1984. To explain the higher death rate for cesarean delivery before 1984, the authors surmise that the use of bupivacaine, 0.75%, for epidural analgesia, before its removal from the market, was responsible.

Although they may be correct, a second factor not considered by the authors—the use of single-shot epidural dosing through a Tuohy-type needle without catheterization—may also have contributed to a higher case fatality rate during the earlier period. As universally taught now, insertion of a catheter into the epidural space allows for repeated administration of smaller drug doses than occurs when giving a "single shot" of a "sufficient" drug dose. Theoretically, the use of incremental small doses limits the deleterious consequences of intravascular or subarachnoid injection and, therefore, should lower the incidence of complications from such injections.

Hawkins *et al.* may not have had access to separate data for single-shot, as opposed to continuous catheter, epidurals in this setting, but it is our understanding that the single-shot technique was widely used in obstetrics before 1984. Even in 1987, for example, Dain *et al.*[2] argued the safety of single-shot epidural local anesthetic use in obstetrics, albeit restricted to the anticipated end of stage 1 labor, and cited its widespread practice at that time. We are not writing to advocate the reintroduction of bupivacaine, 0.75%, for labor epidural analgesia but rather to support current teaching that intermittent epidural injection of small drug doses is inherently safer than single injections of large drug doses. We also believe that the authors' data reflect the improved safety.

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