


**Letter to the Editor**

## An Old Technique for Epidural Intravascular Test Dose in Parturients: Fentanyl Injection

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### Dear Editor

Lidocaine 1.5% with epinephrine 1:200,000 (3 mL) is the most frequently used and effective test dose following placement of an epidural catheter for the detection of intrathecal or intravascular placement. Alone, it may not be effective, but in combination with aspiration, fractionation of epidural local anesthetic injection, and clinical judgment, adverse outcomes may be avoided. It has been suggested that the epidural test dose used for women in labor consisting of local anesthetic and epinephrine is sensitive but not specific. Some cases of positive test dose don't reflect a true intravascular placement of the epidural catheter, causing the catheters to be unnecessarily re-sited [1].

Earlier, fentanyl 100 µg has been suggested as an appropriate test dose in laboring women, with 92.4% sensitivity and 92% specificity [2]. A test dose can thus be considered as positive in case of signs of sedation, drowsiness, or dizziness described by the patient within 5 minutes after injection of 100 µg of fentanyl [3]. These side effects were not reported to be disturbing or unpleasant for the patient [4]. If fentanyl is used as a test dose for intravascular placement, its administration must follow a dose of local anesthetic sufficient to exclude intrathecal placement.

In pregnancy, the epidural veins are engorged leading to occasional inadvertent injury during epidural placement. The appearance of bloody fluid immediately after catheter placement suggests that epidural blood vessels are injured. Frank blood that is emitted spontaneously or by negative pressure from the epidural catheter is suggestive that the catheter is inserted directly into a vein. In such clear-cut cases, test dose is not needed, and the epidural must be directly replaced to avoid the catastrophic complications. We postulate that an intravascular test dose with lidocaine and epinephrine in the presence of either a negative aspiration or bloody fluid in the catheter can yield a false positive result secondary to the leakage of epinephrine into a small vein that was injured by the insertion of epidural catheter or needle, without having the catheter necessarily lodged in that vein. In such cases, we recommend administering fentanyl 100 µg epidurally, wait for approximately 30 min before repeating the test dose with epinephrine. Symptoms of dizziness or drowsiness that might appear within 5 minutes indicate an intravascular injection of fentanyl either secondary to the intravascular placement of catheter or the absorption of fentanyl by the injured vein, similarly to epinephrine. One advantage is pain relief provided by fentanyl to the laboring patient. The absence of these symptoms means that fentanyl was administered probably in the epidural space, thus ensuring analgesia until a second epinephrine test dose can be given. After a waiting time of 30 min following the fentanyl test dose, the possibly injured vessel would clot, and a second test dose of epinephrine is more likely to be negative, confirming the

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correct placement and thus avoiding unnecessary re-siting of the epidural catheter. This technique would be advantageous in patients with a challenging difficult spine and in patients complaining of severe pain while siting the epidural.

### Declarations

### Competing Interests

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Roland Kaddoum and Sahar-Siddik Sayyid have equal contribution to the article as first authors in discussing, drafting, and approving the final version of the manuscript. Jowana Ramadan contributed to drafting and approving the final version of the manuscript. Amro Khalili contributed to

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