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LETTER TO THE EDITOR

# Convulsion and cardiorespiratory collapse with first epidural test dose

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To the Editor:

Accidental intravascular injection of local anesthetic can cause central nervous system (CNS) toxicity, presenting as tremors, convulsions, dysrhythmias, and cardiorespiratory arrest. During epidural anesthesia, a test dose is used to diagnose inadvertent intravascular or intrathecal administration of drugs. We present a case where the test dose itself caused central neural toxicity. A 38-year-old woman, weighing 50 kg and 159 cm tall, with chondrosarcoma in the left femur, presented for tumor resection, irradiation, and reconstruction under a combined epidural and general anesthesia. She had no significant past or family medical history, with no associated comorbid illnesses or evidence of metastasis. She was positioned in the right lateral position for insertion of an epidural catheter under monitoring of heart rate (HR), blood pressure (BP), and oxygen saturation ($SpO_2$). The baseline HR was 100 bpm, BP 124/75 mmHg, and room-air $SpO_2$ 98%. After inserting an epidural catheter in L2–3 interspace and carefully confirming negative aspiration, a 3-ml test dose of 1.5% lidocaine with epinephrine 1:200,000 was injected slowly, with no change in HR. Approximately 1 min later, the patient had perioral paresthesia and twitching followed by loss of consciousness and generalized convulsions. She was immediately turned to the supine position and midazolam 2 mg was given intravenously, followed by thiopentone 250 mg to control the convulsions. After mask ventilation with 100% oxygen, the trachea was intubated and lungs were ventilated. The electrocardiograph (ECG) showed sinus bradycardia with HR 34 bpm during convulsion, (before institution of mask ventilation), which failed to respond to 0.6 mg atropine administered intravenously. A short period of hypoxia may have caused failure to respond to the atropine. As the radial pulse was not palpable, cardiopulmonary resuscitation was started, and 1 mg adrenaline was given intravenously. Radial pulse was noted immediately after resuscitation (ECG showing sinus rhythm), and the patient regained consciousness within 5 min. Aspiration of the epidural catheter revealed blood, and a diagnosis of probable intravascular injection was made. Subsequently, brain magnetic resonance imaging (MRI) was normal, and the patient underwent the planned operation the following week under combined epidural and general anaesthesia without any complication.

The false-negative result of the aspiration test to detect intravascular injection could have been because a multiport catheter was used, with the distal port inside the vein and proximal port in the epidural space, resulting in negative aspiration of blood due to collapsing of the vein over the distal port. The relatively small dose of lidocaine (45 mg) would not be expected to result in the systemic local anesthetic toxicity. However, one case report [1] describes doses as low as 5 ml of local anesthetic can cause CNS toxicity. Concomitant administration of epinephrine potentiates the CNS toxicity of intravenously administered lidocaine [2]. Increased extracellular concentration in the brain would be related to this mechanism. Preservatives such as methylparaben can cause convulsions, but it seems unlikely in this case considering that the volume of injectate was only 3 ml. Though epidural test dose is helpful in diagnosing accidental intravascular or subarachnoid injection of local anesthetic, precaution should be taken, as the test dose itself can cause systemic local anesthetic toxicity and hence cannot be taken lightly. Finally, convulsions

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should be treated with a reduced dose of thiopental, as it can precipitate cardiovascular collapse. To our knowledge, this is the first case report in which the first epidural test dose itself resulted in convulsions and cardiac arrest.

**Conflict of interest** None.

## References

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