

# Case Report

## Epidural Catheter Misplacement

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### Abstract

Epidural anesthesia is one of the most commonly employed type of anesthesia for patients who undergo surgeries of thorax, abdomen or lower extremity and is also considered for perioperative management of analgesia. Epidural catheters can undergo misplacement or migration into subarachnoid space, vessels, subdural space and thoracic cavity. This is a case report of misplaced epidural catheter. There is a disadvantage of epidural catheters getting misplaced during perioperative period. Therefore, it requires a continuous monitoring and observation of these patients in order to prevent and minimize the adverse events related to the misplacement of epidural catheters

**Key Words:** Epidural anesthesia, Perioperative analgesia, Misplacement, Migration.

### Introduction

Epidural anesthesia is one of the very effective ways to deliver anesthesia for thoracic, abdominal and surgeries of lower extremities. It is also useful to provide analgesia during peri-operative period, labor and delivery, and in chronic pain syndromes.<sup>1</sup> Misplacement of epidural catheter is one of the commonest complications occurring during epidural catheterization. The tip of the epidural catheter has to be in the epidural space to provide effective pain relief.<sup>2</sup> It is very common for epidural catheters to either become misplaced or migrate into subarachnoid space, subdural space, vessels and thoracic cavity.

### Case Report

A 60 year old male patient presented with left lateral femoral condyle fracture. He was posted for open reduction and internal fixation. Pre-anesthetic assessment was done and patient was categorized as ASA Gr II.

Plan of anesthesia was intermittent doses of epidural anesthesia and the patient was counseled about the anesthetic technique and informed consent was obtained. Patient was received in the Operation Theatre and base line vitals were noted.

Intravenous access was secured using 18G and patient was preloaded with Ringer's lactate 10ml/kg body weight.

With patient in sitting position, under strict aseptic precautions, after adequate local infiltration of skin with 2% lignocaine, an 18G epidural needle was inserted in L2-L3 interspace. Epidural space was identified using loss of resistance to saline technique.

Distance from skin to epidural space was found to be 5cms. Epidural catheter was inserted through the epidural needle which could be passed without any resistance. Five cm of epidural catheter was left inside epidural space. Careful aspiration for CSF/blood was done through epidural catheter which turned out to be negative despite repeated aspirations. Epidural catheter was fixed on the back using sterile dressings & patient made supine. Test dose was given, again after confirming negative aspiration, using 3cc of 2% xylocaine with 1:200000 adrenaline through the epidural catheter.

Intermittent dose of Levobupivacaine 0.5% 15ml was given over 15minutes with careful negative aspiration for every 3ml with no evidence of CSF/Blood. Despite adequate time, there was no sensory and /or motor block. Hence case was converted to General Anesthesia. Patient was induced with Propofol 100mg and Atracurium 30mg, intubated with #7.5 mm I.D ETT. Intra-op was maintained with O<sub>2</sub>: air and isoflurane 1%.

Post-surgery, patient was reversed and extubated. A non-ionic contrast was given through epidural catheter and x-ray was taken which revealed catheter exiting through dural space.

### Discussion

The usage of epidural anesthesia is increasing and so we have to be vigilant enough to avoid hazards or complications arising out of its usage. Anatomically the duramater in the lumbar region is comparatively thicker on its anterior side and thin posteriorly. This contributes to dural puncture by epidural catheters with a pointed tip.<sup>3</sup> Epidural catheters could either

be misplaced during time of placement, or migrate during the course of treatment. The most common site of migration is the transforaminal migration of the catheter, which have been described during epidural analgesia.<sup>4</sup> And also fluctuations in epidural pressure and cerebrospinal fluid (CSF) oscillations can promote the displacement of epidural catheters.<sup>5</sup>

The most common position for inserting the epidural catheter is the sitting position. It has been found to be most accessible and more accurate compared to that of the lateral position. But, the epidural venous plexus happens to get distended during sitting position, which may technically increase the risk of vascular puncture, especially in pregnancy.<sup>6</sup>

Identification of epidural space is essential for the correct placement of epidural catheter. There are many methods through which an epidural space can be identified. Of which, one of the most reliable method is the loss of resistance (LoR) technique by using saline, which has become the most widely used method.<sup>7</sup>

Another method through which the epidural space can be identified is the hanging drop technique. It is done by using the negative pressure that exists within the epidural space. However, this is not a reliable method to identify the epidural space according to many studies. It also poses an increased risk of dural perforation as it was found that identification of the epidural space was 2 mm deeper for the hanging drop when compared with LoR.<sup>8</sup>

It is essential to acknowledge that the ligamentum flavum is not continuous in all patients, and there might be presence of midline gaps which may mask the LoR to needle advancement and injection of air/saline less perceptible when the midline approach is used.<sup>9</sup> The insertion of catheter should be done not more than 4 cm into the epidural space. Migration of epidural catheter was found to be less if the catheter was sutured, but resulted in increased inflammation at the puncture site.<sup>10</sup>

## Conclusion

As it is found, it is very common for failure of epidural anesthesia, which can occur in up to 30% of times in clinical practice. There are many factors which can help in the successful placement of an epidural catheter. Epidural catheters could either be misplaced during time of placement itself, or become migrated during the course of treatment. The optimal depth of insertion in order to avoid migration of epidural catheter in adults is found to be 5 cm. There is no assured technique that is fool proof for proper placement.

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