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## Case report

### BLOCKAGE OF EPIDURAL CATHETER WITHIN CONNECTOR ASSEMBLY

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### ABSTRACT

Failure to inject a drug through the epidural catheter because of epidural catheter connector malfunction is a rare complication. In this report, we describe a case of epidural catheter – connector malfunction in a 45 years old male undergoing emergency explorative laparotomy for haemoperitoneum under general anaesthesia and insertion of epidural catheter for post operative analgesia. After insertion of catheter after completion of surgery, drug could not be injected in the catheter. After common causes like kinking, knotting, occluded catheter were ruled out, the cause was found to be in the epidural catheter connector assembly which is not encountered frequently. This case warrants that anaesthesiologists must also be aware of rare causes and the preventive steps to avoid such complications.

**Keywords:** Epidural catheter – connector assembly, Blockage of epidural catheter

### INTRODUCTION

Epidural technique of anaesthesia is now widely used by anaesthesiologists all over the world. By placing an epidural catheter, regional anaesthesia can be performed and prolonged by injecting local anaesthetic drug and postoperative analgesia<sup>[1]</sup> can also be provided by injecting epidural local anaesthetics or narcotics<sup>[2]</sup>. Adequate post operative epidural analgesia fastens the recovery as it decreases the stress response and the load on cardio respiratory, renal system and leads to decrease in morbidity and prevent further complications like thrombosis, embolism<sup>[3, 4]</sup> etc. Every patient has the right for adequate pain relief after surgery. Failure to inject drug through a catheter is a well known<sup>[5, 6]</sup> complication which can be due to kinking or knotting of the catheter but rarely may be because of connector assembly malfunction.

### CASE REPORT

A 45 year old, 70 kg male patient was put for emergency exploratory laparotomy for

haemoperitoneum (as revealed on FAST scan) following blunt trauma to the abdomen. On arrival to operation theatre, he was quickly examined for any co morbidities, Nil per Oral status. Intravenous access was gained by placing two 18 G cannula in both hands and normal saline was started. He was premedicated with inj Ranitidine iv 50 mg, inj Ondansetron iv 4 mg, inj Glycopyrolate iv 0.2mg, inj Tramadol iv 1mg/kg. Patient's vitals like Non Invasive Blood Pressure, Electrocardiography, SpO<sub>2</sub> (oxygen saturation) were recorded and found to be within normal limits. Inj Lidocaine iv 1.5mg/kg was given to attenuate the hemodynamic response to laryngoscopy and intubation. Preoxygenation with 100% oxygen was followed by induction with propofol iv 2mg/kg and succinylcholine iv 75 mg using modified Rapid Sequence Intubation (RSI) technique. Patient was intubated with size 8.5 Endotracheal tube and position was confirmed by bilateral auscultation of breath sounds and EtCO<sub>2</sub> monitor was attached. Anaesthesia was maintained

with inj. Atracurium(30 mg bolus and 5 intermittent top up doses of 10 mg at 25 minutes interval), N<sub>2</sub>O :O<sub>2</sub> 67:33%and Isoflurane inhalation at 0.6%.Duration of the surgery was 140 minutes and1.5litres of Normal saline 500ml of Ringer's lactate and 1 unit of whole blood were transfused. Urine output at end of the surgery was 250 ml.

After completion of the surgery, insertion of epidural catheter (Perifix 300 mini set Braun) was planned for post operative analgesia. He was put in the left lateral decubitus position, and under aseptic conditions, epidural Tuohy needle 18 G was advanced in L2-3 intervertebral space and epidural space was identified by LOR (loss of resistance technique) to air at 5 cm marking on Tuohy needle. After test dose, single shot 0.125% bupivacaine (12 ml total volume) was injected for postoperative analgesia and also to facilitate insertion of catheter by predistension of the epidural space. After that, epidural catheter was inserted through the needle and fixed at 11 cm marking. Catheter was secured in place with adhesive tapes, avoiding any kinking of catheter at the insertion point or at the neck and then patient was carefully turned to supine position. For reversal, inj. Neostigmine 2.5mg iv and inj Glycopyrrolate 0.5 mg iv was given. After satisfactory reversal from neuromuscular blockade, patient was extubated.

Before shifting from OT, 2ml of 0.125 % bupivacaine was tried to be injected through the catheter to check for patency, but even after using moderate force, it could not be injected. Kinking of the catheter was thought to be the cause of obstruction. Adhesive tapes were removed carefully, but no kinking was noticed along the course of the catheter. Catheter was then pulled 0.5 cm out but still drug could not be injected. After repeated attempts, failure to inject drug using moderate force also, led to the removal of the catheter. The tip of catheter was checked for blockage by blood clot but it was not the case. Even after removal from the patient, drug could not be injected through the catheter using moderate force. To check for patency of the catheter, a different connector was attached to the first catheter, and it led to free flow of drug. So cause of obstruction was thought to be in the connector assembly and was confirmed by the fact that even when the catheter from the different set was attached to the first connector, drug could not be injected.

## DISCUSSION

Though epidural route is routinely used for regional anaesthesia and analgesia in terms of PCEA, post operative analgesia, pain relief in chronic conditions<sup>[7]</sup>but the failure of the block remains a great concern to the anaesthesiologist. 14% of all failure of epidural block has been found to be due to technical reasons<sup>[8]</sup>.Failure to inject the drug through the catheter can be due to various reasons:

Malposition of tip of catheter, blocked tip of catheter by blood clot<sup>[9]</sup>, kinking , knotting<sup>[9]</sup>, transection of catheter, manufacturing defect<sup>[10]</sup> or rarely connector assembly<sup>[11]</sup>

The connector used in this case hadtwo parts. It was a type of 'snap 'catheter connector <sup>[12]</sup>. It had a transparent flap and a yellow base. The catheter passes through the yellow base and the transparent flap clicks over the base and holds the catheter in place i.e. in the port for catheter at the base. The connector assembly has a midline arch in the upper flap which holds the catheter <sup>[11]</sup> and helps in correct placement of the catheter in the connector. A distinct click sound confirms correct placement of the connector which can then be attached to the syringe. Filters may be used which provide an additional degree of safety in preventing bacterial infections. Minimal dead space enables accurate dosing. A high pressure resistance up to 7 bars enhances safety during manual injection. It provides proper grip, thus providing more secure catheter connection <sup>[12]</sup>.

Kinking and knotting can occur if more than adequate length is inserted into the epidural space. Anaesthesiologist must be aware not to advance the epidural catheter more than 5 cm into the epidural space as greater length of the epidural catheter increases the risk of complications like kinking/curling/knotting<sup>[13,14,15]</sup> which subject the patient to further complications. As these are the common causes of catheter blockage that can be thought of, these should be ruled out by carefully observing the length and depth of the catheter. As in our case, when all other causes were ruled out, catheter was withdrawn carefully from the patient and the procedure abandoned. Then the connector assembly was properly examined as the catheter seemed to be patent. Failure to inject drug through the connector could be because of two causes: inadequate length of catheter in connector which may partially occlude it

(Ruled out in our case) or manufacturing defect (defective flap connection or increased or malaligned arch completely occluding the catheter)<sup>[11]</sup>

According to Goswami et al<sup>[11]</sup>, connector malformation due to slightly enlarged midline arch can also be a cause of failure of injection of drug which could have been the reason in this case.

Changing of the connector from a sterile set could have been the remedy and should be thought of prior to removal of the catheter from the patient thus avoiding the unnecessary removal and depriving the patient from post operative analgesia by epidural route.

## CONCLUSION

After ruling out common causes of failure to inject drug through the catheter, catheter connector assembly malfunction should be thought of as a possible cause, whether due to misplacement of the catheter into the connector or manufacturing defect. Whether proper functioning of the catheter along with the connector assembly should be confirmed by flushing the catheter<sup>[16]</sup> prior to its placement in the patient or not remains an open question for every anaesthesiologist as excessive manipulation and handling of the catheter should be avoided to prevent even the slightest possibility of contamination.

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**Conflicts of Interest:** Nil

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