

Needle through Needle Combined Spinal Epidural Anaesthesia - A Case Report

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Abstract: *Background:* The combined spinal–epidural technique (CSE) has become increasingly popular in recent years. It can be defined as the intentional injection of drug into the subarachnoid space and the placement of a catheter into the epidural space as part of the same procedure. Both midline and paramedian approaches can be used for CSE. In the Needle-through-needle technique epidural needle is used to identify the epidural space. A spinal needle is then passed through the epidural needle into the subarachnoid space and the subarachnoid block performed. After the removal of the spinal needle, an epidural catheter is placed that can be used subsequently. Developments of this technique have included the design of epidural needles with ‘backeyes’ or holes in the greater curvature of the needles, which allow the epidural catheter to be inserted away from the dural puncture site, thus reducing the risk of inadvertent subarachnoid placement of the epidural catheter. Success rates of up to 99% have been reported with certain ‘locking’ needles, which is comparable with the reported success rates of 98% with conventional ‘non-locking’ needles used in some studies. We report a case of 76 year old patient with long standing history of diabetes and hypertension with anticipated difficult spine who sustained an inter trochanteric fracture left femur for Proximal femur nailing (PFN) an aesthetically managed by Needle through needle technique of combined spinal epidural anaesthesia.

Keywords: Combined spinal–epidural anesthesia, Subarachnoid block (SAB) Needle through needle technique, Bupivacaine, Ropivacaine, Proximal femur nailing (PFN), Geriatric, Postdural spinal headache (PDPH), COVID19

1. Introduction

Combined spinal and epidural (CSE) technique has been widely employed for labor analgesia and lower extremity surgery, as it combines the advantages of spinal and epidural anesthesia. Spinal anesthesia can rapidly offer a reliable conduction block. Epidural anesthesia can flexibly prolong anesthetic duration and provide postoperative pain relief via an epidural catheter, while severe complications of the operations above have remained frustrating. The most widely used technique for performing CSE, the single-segment “needle-through-needle” (NTN) technique still has several potential drawbacks. Intrathecal catheter migration, failure to obtain cerebrospinal fluid (CSF), and paresthesia have appeared in some cadaver studies and isolated case reports. Moreover, stability of the spinal needle during injection of drugs into the subarachnoid still needs improvement. To diminish these complications and improve satisfaction of both operators and patients, several new CSE sets have been yielded. One new set is the “needle beside-needle” (NBN) technique. NBN is an orbital CSE needle with greater curvature of the epidural needle tip and with a groove on the epidural needle for spinal needle guidance. SAB is preferred by many anesthesiologists in view of cost effectiveness, low risk of cognitive dysfunction. For a successful SAB surface anatomy and palpation of spinous process, interspaces are important. In some clinical scenario like ankylosing spondylosis, kyphoscoliosis, previous spine surgery, it may be difficult or impossible to identify anatomical landmarks. This may lead to multiple attempts at lumbar puncture, which may lead to discomfort and pain for the patient or risk causing epidural/spinal hematoma which

is a very serious complication. Spinal anaesthesia (Sub arachnoid block: SAB), has a great impact on modern-day surgery. In lower abdominal and lower limb surgery SAB is widely used. It offers several advantages over general anaesthesia (GA) like faster onset, intense motor block, ease of technique, avoid polypharmacy. Accurate identification of the subarachnoid space is paramount as multiple attempts at needle insertion may cause patient discomfort, higher incidence of spinal hematoma, trauma to the neural structures and PDPH. The most commonly practiced technique is the midline approach. This approach is technically difficult in the geriatric patients because of degenerative changes in the spine.

2. Case Report

We are reporting a case of a 76year old female patient with known case of long standing diabetes, hypertension controlled with multiple drugs with anticipated difficult spine in view of previous history of compression fracture spine L1, 2 level who was managed successfully by Needle through needle technique of Combined spinal epidural anaesthesia. Previous surgical history of repair of Right intertrochanteric fracture done under regional anaesthesia with much difficult access. On examination anemia was elicited and corrected with blood transfusion. Airway examination revealed mallampatti class 2, Upon examination of spine we anticipated difficulty with age related kyphotic change and crowded interspinous space. Airentry was equal on both sides. Other blood investigations were normal. Chest Xray revealed cardiomegaly. All other system examinations were normal. Echocardiography

revealed ejection fraction 65% with good LV systolic function. Considering the age and the necessity of a surgical correction at the earliest an informed high risk written consent was obtained for combined spinal anaesthesia procedure. We decided to avoid General anaesthesia in view of prevailing COVID 19 pandemic and give a trial of CSE anaesthesia. However, we informed the patient about chance of failure of technique and possibility of conversion to GA when needed.

On Previous day of surgery a detailed written informed consent for planned procedure (PFN) under regional anaesthesia as well as consent to revert to general anaesthesia if needed was obtained. Overnight fasting advice along with T.Pantoprazole 40mg at night and morning of surgery and T.Alprazolam 0.25mg at night.

On the day of surgery - OT including Anaesthesia work station, difficult airway cart, Combined spinal epidural set and emergency drugs were checked and kept ready.

Preinduction monitors like E.C.G, Noninvasive blood pressure monitor, pulse oximetry, skin temperature were connected. After receiving the patient to the OT we secured two wide bore cannulae and started intravenously balanced salt solution. Positioned the patient in left lateral position for combined spinal epidural anaesthesia by needle through needle technique via a combined spinal epidural catheter set. L4, 5 Space was prepared and draped under strict asepsis, local infiltration was given with 2ml of 2% plain lignocaine.

Using Combined spinal epidural set lumbar L4, 5 epidural space was confirmed by loss of resistance to air technique. After confirming epidural space, the needle was locked, and then a 27 gauge spinal needle was introduced through the epidural needle after removing the stylet. A clear CSF flow was obtained. 2.4ml of 0.5% heavy bupivacaine with 30 microgram buprenorphine was given after aspirating CSF. Then spinal needle was removed and epidural catheter was threaded in, following which a test dose of 3ml 2% lignocaine with 1:20000 adrenaline was given which was negative for intrathecal and intravenous route. Epidural catheter was fixed at 11cm.

Patient was positioned supine after injection. Level of blockade was checked and found to be adequate. Intra-operative and post-operative periods were otherwise uneventful. Post operatively 0.2% plain ropivacaine 3ml to 4ml was given epidural for postoperative pain relief.

3. Discussion

Combined spinal epidural anaesthesia is a safe, effective, reliable technique with stable haemodynamic along with provision of prolonging analgesia compared to spinal anaesthesia alone for high risk geriatric patients undergoing major orthopaedic surgery. To reduce the incidence and severity of hypotension a sequential combined spinal epidural technique can be used in geriatric age group. In the Needle-through-needle technique epidural needle is used to identify the epidural space. A spinal needle is then passed through the epidural needle into the subarachnoid space and

the subarachnoid block performed. After the removal of the spinal needle, an epidural catheter is placed that can be used subsequently. The needle-through-needle technique can also be performed by inserting a catheter into the epidural space before the spinal block. By carrying out the procedure in this order, the warning signs of misplacement of the epidural needle or catheter (such as paraesthesia) are preserved during the insertion of the CSE. However, this technique risks damage to the epidural catheter as the spinal needle is inserted.

4. Conclusion

Needle through needle technique for combined spinal epidural anaesthesia is very useful in anticipated difficult spine. Success rates of up to 99% have been reported with certain 'locking' needles, which is comparable with the reported success rates of 98% with conventional 'non-locking' needles in Needle through needle technique for combined spinal epidural anaesthesia.

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6. Conflict of Interest

No conflict of interest

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