
Thoracic spinal anaesthesia for caesarean section

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Abstract

This report shows that the spinal anaesthesia technique, applied in the lower thoracic region (T10) and with a minute dose of local anaesthetic, can be used to provide a segmental subarachnoid block sufficient to allow lower segment caesarean section to be performed, even in a patient with severely abnormal respiratory function and patients having hemodynamically instability like Pre-Eclampsia or even in patients with lower lumbar region skin infections.

Keywords: Covid, Lung fibrosis, Pre-eclampsia, Burns, Scar, Lumbar scoliosis

Introduction

The preoperative evaluation and risk assessment has always been a critical aspect of safe surgical practice, and in the midst of the SARS-CoV-2 pandemic, it has become even more crucial to patient safety. Emerging data show that surgical procedures in patients who test positive for coronavirus disease (COVID) are associated with worse clinical outcomes and increased postoperative complications and mortality. Post Covid 19 complications may include multiple organ systems like post covid lung fibrosis which leads to increased risk of general anaesthesia and increased post-operative complications and poor surgical out comes with prolonged stay in hospital post operatively. Specially for pregnant females who are been posted for caesarean section who require early initiation of breastfeeding which ensures that the infant receives colostrum plus it facilitates emotional bonding of the mother and the baby and has a positive impact on the duration of exclusive breastfeeding also helps in early mobilisation of the patient post operatively which has shown to improve recover faster post-surgery. Thoracic spinal anaesthesia is a type of segmental block which requires a very low dose of local aesthetic agent to provide a proper analgesic and anaesthetic effect required for the surgery to be performed with very few hemodynamically

changes and involvement of respiratory muscles at low dose. As low dose of the drug is given the duration of the segmental block also wears off faster and leads to early mobilization. Operations that have been performed with success include abdominal cancer surgeries, breast cancer surgeries, and laparoscopic cholecystectomies. In some of these surgeries, the procedure was performed in healthy individuals with excellent outcomes, so, in the future, the procedure may provide benefits for healthy patients as well.

CASE 1:

Patient Mrs. X, 28yr old female Gravida 2 para 1, previous LSCS in view of scar tenderness, with BS: 38.2 weeks and BD: 38 weeks. Presented to OPD with complains of lower abdominal pain, tachycardia, scar tenderness, Spo₂:92 % on room air, with history of covid 19 positive and hospital admission for the same. Previous chest Xray was suggestive of lung fibrosis.

Patient was admitted and been prepared for emergency caesarean section. Thoracic spinal anaesthesia was given with 25 G Quincke Babcock needle at T10 level. Sensory and motor level was achieved from T2 to S1. Minimal hemodynamical changes seen. A successful Caesarean section was performed. Baby cried at birth and was handed over to the paediatrician for further management and evaluation. Post operatively the patient maintained her vital was supplemented with 6 lit O₂ via Hudson mask. Patient was monitored all along the case.

CASE 2:

A 30yr old Primigravida at 38weeks of gestation presented with nausea and vomiting, headache and blurring of vision since one week, On examination BP:168/110 mmHg, tachycardia, edema present bilateral lower limb extending to the sacral region, urine albumin +1,with tinea corporis present over the back involving the lumbar region was taken up for emergency Caesarean section. Thoracic spinal anaesthesia was given with 25 G Quincke Babcock needle at T10 level. Sensory and motor level was achieved from T2 to S2. Minimal hemodynamic change where seen. No complains of breathlessness or difficulty in breathing where seen. A successful caesarean section was performed with adequate analgesia and anaesthesia. Patient was monitored all throughout.

CASE 3:

Patient Mrs. X, 22yr old female Gravida 2 para 1, previous LSCS in view of scar tenderness, with BS: 38.6 weeks and BD: 38.4 weeks. Presented to OPD with complains of tachycardia , scar tenderness , Spo₂:99 % on room air, with history of old fibrotic scar marks over the lower back, and lower limbs.

Patient was admitted and been prepared for emergency caesarean section. Thoracic spinal anaesthesia was given with 25 G Quincke Babcock needle at T10 level. Sensory and motor level was achieved from T2 to S1.Mild hemodynamical changes seen post spinal anaesthesia. A successful Caesarean section was performed. Baby cried at birth and was handed over to the

paediatrician for further management and evaluation. Patient was monitored all throughout the perioperative period.

CASE 4:

Patient Mrs. X, 27yr old female Gravida 3 para 2, taken up for LSCS in view of previous 2 LSCS with BS: 40 weeks and BD: 40.2weeks. Presented to OPD with complains of lower abdominal pain radiating to inner thighs with history of active tinea corporis over the back and groin area.

Patient was admitted and been prepared for caesarean section. Thoracic spinal anaesthesia was given with 25 G Quincke Babcock needle at T10 level. Sensory and motor level was achieved from T2 to S1. Minimal hemodynamical changes where seen post spinal anaesthesia. A successful Caesarean section was performed. Baby cried at birth and was handed over to the paediatrician for further management and evaluation. Patient was monitored all throughout the perioperative period.

Discussion

Anaesthesiologist have always been worried and cautious about performing subarachnoid block above the level of termination of the spinal cord, due to the high risk of injuring the cord or the nerves emerging through it via the needle tip of the subarachnoid block needle. But there have been studies in past showing the usefulness and acceptance of performing subarachnoid block above the level of termination of spinal cord. One of the few studies done in this field was done via performing the block in the thoracic spinal region and the block achieved was in T10-L2 segments, with successful performance of the surgery and with minimal perioperative hemodynamic changes, as there is a risk of blockage of cardio-accelerators fibers in thoracic subarachnoid block. There was another concern regarding the same block of blocking of intercostal nerves and thus, leading to respiratory compromise, but none was observed in the study done by us. But the thoracic block was seen to affect coughing and forceful expiration due to the involvement of the nerves of the supplying the anterior abdominal wall muscles.

The thoracic subarachnoid block offers various advantages over the lumbar subarachnoid block like offering better anterior abdominal wall muscle relaxation, thus offering the surgeon a better field and easier manipulation inside the abdomen in an awake patient, along with a faster recovery in the postoperative period. There are minor or minimal hemodynamic variations in the perioperative period in the patients receiving thoracic spinal anaesthesia. There is also a faster recovery from the motor loss thus, leading to early postoperative ambulation of the patient and therefore early recovery and discharge. Another important advantages leading to blockade of thoracic nerves is that the amount of cerebrospinal fluid in this region is less than that compared to found in the lumbar and cervical region and, also the thoracic radiculae are thinner than the rest, thus offering good block.

For abdominal surgeries thoracic subarachnoid block can be considered as it provides a better and limited dermatome involvement, with its various advantages discussed above. But the patients

need to be carefully examined by experienced anaesthesiologists for observation of any adverse outcomes and their proper and timely management as per requirement. So, this technique can be used as an alternative to lumbar subarachnoid block, and also in a few high risk cases.

Figure1: Graph showing the variability in heart rate (bpm) in the perioperative period

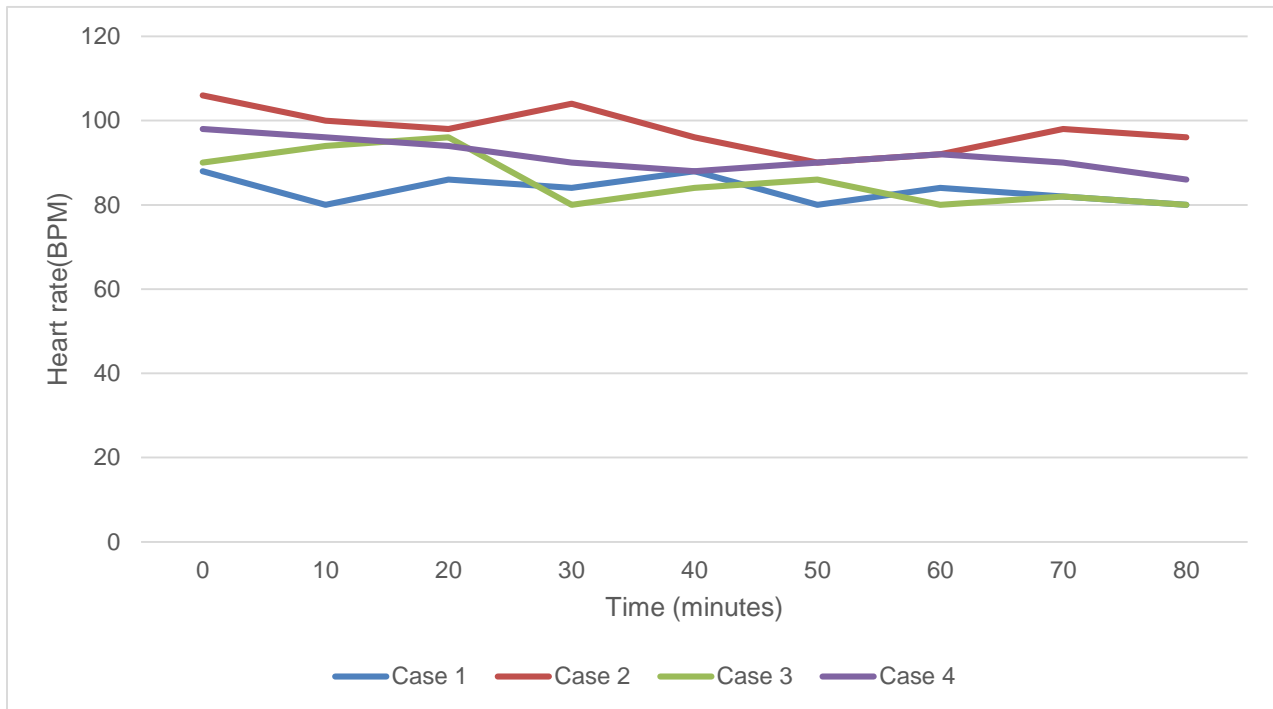


Figure2: Graph showing the variation in systolic blood pressure (mmhg) in the perioperative period

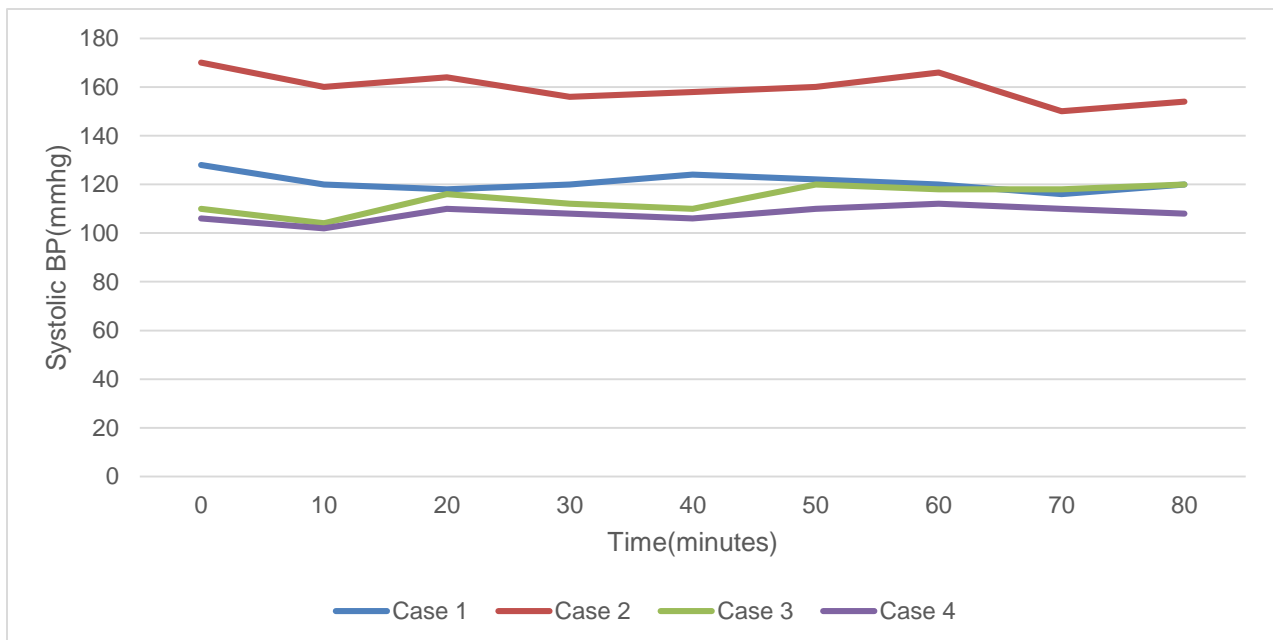
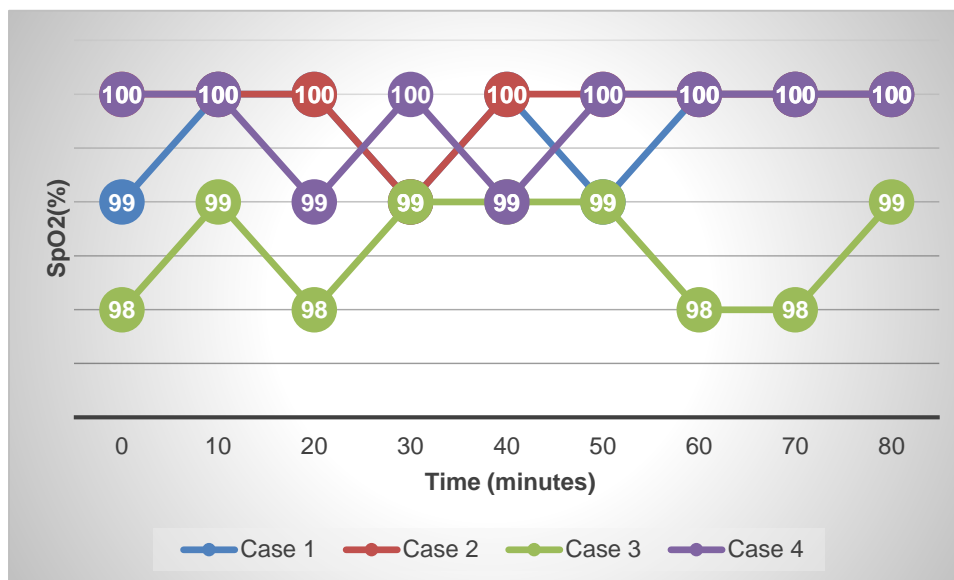


Figure3: Graph showing variability in SpO₂ in the perioperative period

Conclusion

Segmental thoracic spinal anesthesia can be used successfully and effectively for lower segment cesarean section by experienced anaesthetists, with its favourable effects of early ambulation of the patient, better hemodynamic stable all throughout the perioperative period, less frequency of urinary retention, ease of administration and also being administered in cases where lumbar subarachnoid block cannot be achieved. Further studies are warranted to compare its effect, especially on hemodynamics with known techniques.

Conflict of Interest

The undersigned authors of the article - “Thoracic spinal anaesthesia for caesarean section” have no conflict of interest with any agency and no financial aid has been taken for creating this article.

ABBREVIATIONS

RA: Regional anesthesia

LSCS: Lower segment cesarean section

REDF: Reversal of end-diastolic flow

NIBP: Non-invasive blood pressure

HR: Heart rate

SpO₂: Pulse oximetry

ECG: Electrocardiograph

SAB: Subarachnoid block

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