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Effective Awake Combined Spinal Epidural Anesthetic (CSE) for Major Abdominal Surgery in a High-Risk Gynecological Cancerous Patient with Chronic Obstructive Pulmonary Disease (COPD): A Case Report

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1. Abstract

This Awake combined spinal epidural anaesthesia as the sole anaesthetic technique was successfully employed for an extended midline laparotomy for gynaecological cancer. The patient was a heavy smoker with chronic obstructive pulmonary disease. The procedure included total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, appendectomy and right hemicolectomy. The nine hours surgery was tolerated very well and the CSE anaesthetic technique, which has been shown to reduce intra-operative and post-operative respiratory complications, may have significantly contributed to the prompt, complication free recovery experienced by the patient and her early discharge from the hospital.

We report a case of awake major abdominal surgery removing a very large complex ovarian metastatic carcinoma causing bilateral basal lung atelectasis in a high-risk heavy smoker (30 to 60 cigarettes/day/50 years) 70 year old patient with chronic obstructive pulmonary disease (COPD), performed effectively under combined spinal epidural anaesthesia as a sole technique. Reviewing the literature, no similar cases have been reported before.

2. Introduction

Regional anaesthesia has been always a good alternative for high risk surgical patients when general anaesthetic (G.A.) is contraindicated [1]. Combined spinal epidural anaesthesia (CSE) found to be an effective anaesthetic technique for major laparotomy especially for prolonged surgical procedures [2].

We report an interesting case of 70-year-old gynaecological cancerous patient with a history of heavy smoking (30 cigarets/day/50 years) and chronic obstructive pulmonary disease (COPD) scheduled to have a mid line extended laparotomy removing a very large complex ovarian metastatic mass arising out of the pelvis and causing bilateral basal lung atelectasis adding to the complexity of the patient's lung pathology.

The expected long major operation was planned to be done by a gynecological surgeon and a colorectal surgeon and it included total abdominal hysterectomy, bilateral salpingo-oophorectomy, In view of the above-mentioned, general anaesthesia (G.A.) has been ruled out and the patient was omentectomy,

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appendectomy and right hemicolectomy.

consented for CSE anaesthesia plus sedation.

3. Anaesthetic Technique

A day before surgery, the patient was seen on her ward for a pre operative assessment. She gave a history of being independent, a heavy smoker (30 to 60 cigarets/day/50 years), COPD (not on any treatment) with a secondary polycythemia (Haemoglobin; 16.7 g/dL) and hypertensive on Ramipril 10 mg/day. She was never been admitted to hospital before until she was admitted to the accident and emergency department with acute abdominal pain and severe vomiting, treated with Intravenous (IV) fluids and analgesia. Later, her general condition and the results of her blood work were stable and within normal.

Her computerised tomography (CT) Chest/Abdomen/Pelvis with Contrast showed the following:

- Bilateral basal lungs atelectasis.
- Prominent small bowel loops and increased soft tissue shadowing in the right lower abdomen consistent with calcification in mucinous tumour, most likely carcinoma of the ovary.
- A large complex solid-cystic mass with calcification, arising out of the pelvis measuring 22 cm x 12 cm x 30 cm. Marked omental nodularity with calcification. Multiple dilated loops of proximal small bowel with a transition point anteriorly in the left side of the abdomen and slight thickening of the bowel at this point. The small bowel and colon distal to this are collapsed. Solitary slightly enlarged left common iliac node, 12 mm short axis.

In view of the above, she was scheduled for open total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, appendectomy and right hemicolectomy under CSE anaesthesia with sedation after ruling out G.A. due to her complex lung pathology.

On the day of surgery, the patient was premedicated with Oxycontin 10 mg, Omeprazole 20 mg, ondansetron 4 mg and Dexamethasone 10 mg 2 hours preoperatively.

On arrival to theatre, the patient was first checked in as per the world health organisation protocol (WHO), two peripheral IV Accesses (16 G.) and a radial arterial line were inserted under local anaesthesia (L.A.) in addition to the routine non invasive monitoring (ECG, pulse oximeter and Dinamap blood pressure monitoring).

While the patient was having an Oxygen mask (4 L/m) in a lateral position and sedated with Fentanyl 100 µg and Midazolam 2 mg, CSE anaesthesia was performed via two separate injections technique [3].

- First, the Epidural was performed using a 16 G Touhy needle at T6 to T7 spinal level and confirmed by a sudden loss of resistance to air and by a positive siphon test through the epidural catheter, where 5 cm of the catheter was left in. Later, the block was tested for intravenous or subarachnoid catheter placement by injecting 2 ml of 2% Lignocaine with Adrenaline 1:200:000.
- Second, the spinal injection was done using 25 G spinal pencil point needle at level L2 to L3 and the spinal block was introduced using 4 ml of isobaric Bupivacaine (Marcaine) 0.5% with 0.4 mg Diamorphine achieving a block up to T4 level and surgery was allowed to begin under a sedation cover of Propofol TCI (0 µg/ml to 2 µg/ml) and the patient was breathing Oxygen spontaneously of 4 L/m all the way through.
- Two hours later and just before wearing off the spinal block, the epidural block was introduced to take over carefully injecting a bolus of 20 ml Leavobupivacaine (Chirocaine) 0.25% + 4 mg Diamorphine slowly down the epidural catheter and then a bolus of 10 ml 0.25% Chirocaine was injected carefully every hour until the end of surgery [4].
- Toward the end of surgery, an epidural bolus injection was given (10 ml of Chirocaine 0.25%) and the epidural was replaced by a continuous rectus sheath block. The reason of doing that was due to lack

of epidural care on the ward and the unavailability of the high dependency care because of the current covid-19 situation.

- At the end of surgery, sedation was stopped and the patient was allowed to wake up spontaneously, peacefully and quietly.

- In the recovery room, the patient was kept under observation for about one hour. She was fully awake, completely pain free (pain score = 0), clinically stable with normal vital signs, blood gases and with normal urine out put and able to have some sips of water. Later, she was sent back to her ward with Fentanyl patient controlled analgesia (PCA) as a back up.

- Reviewing the patient next day, she continued to improve, able to set out of bed with some assistance, the PCA was stopped and her pain was controlled with simple oral analgesia.

- Three days later, she was discharged from the hospital safely.

4. Discussion

We believe that we as anasethetists have a pivotal role facilitating early post-operative recovery providing the safest anaesthetic technique and may be tailoring his anaesthetic strategy to meet the surgical demand in view of the patient's general condition [5]. General Anaesthesia in high risk surgical patients with significant pulmonary disease can trigger some adverse effects including; pneumonia, impaired cardiac performance, neuromuscular problems, biotrauma and barotrauma and subsequently intra and post-operative hypoxemia [6]. Avoiding endotracheal intubation decreases the risk of postoperative. respiratory complications especially in elderly COPD patients [6,7]. Development of safe anaesthetic and analgesic techniques including regional anaesthesia have provided an important tool for excellent quality of surgery and enhanced recovery [8,9]. The combined spinal-epidural technique (CSE) has become increasingly popular in recent years and it has been used for a wide variety of surgery including obstetric and non-obstetric surgery in adults including orthopaedic, urological, vascular, gynaecological and general surgical procedures [10].

The technique 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. Different CSE techniques have been described including; needles-through-needle or two separate needles technique [3]. Introducing the blockade could be continuous, sequential or standard [4].

Ideally, CSE anesthesia incorporates the advantages of each procedure while avoiding the disadvantages. The advantage of the CSE is that it has two components, the spinal where the neuro-axial block can be more solid and achieved rapidly and the epidural component, where the epidural catheter can be used to prolong or modify the block through re-dosing or continuous infusion of local anesthetic. Intensity of blockade may be altered by manipulating local anesthetic concentration that makes the CSE technique has greater reliability requiring less anaesthetic intervention and makes it superior to the epidural alone in providing anaesthesia and analgesia [3].

Although there is increased preparation time for surgery compared with general anesthesia, the technique of CSE anesthesia decreases recovery time in the post-anesthesia care unit, time to postoperative patient fluid intake, narcotic requirements and episodes of emesis [11].

Disadvantages potentially avoided include the single administration of local anesthetic and unpredictable level of blockade with spinal anesthesia and patchy blockade, poor sacral spread and possible local anesthetic toxicity associated with epidural anesthesia [12].

CSE anaesthesia blunts the decrease of subcutaneous tissue oxygen tension caused by surgical stress and adrenergic vasoconstriction during major abdominal surgery providing sufficient tissue oxygenation and

improving cardiac, respiratory and gastrointestinal function and may decrease the incidence of surgical wound infection. Splanchnic sympathetic nervous blockade results in reduced inhibitory gastrointestinal tone and increased intestinal blood flow, positive factors where a colonic anastomosis is to be performed [13]. Post operative myocardial infarctions are reported to be significantly lower due to CSE anaesthesia [14].

Several systemic reviews have found that CSE anaesthesia with or without post-operative epidural analgesia reduce post- operative pulmonary infections compared with general anaesthesia with or without post-operative systemic analgesia [15].

Another study showed that in patients undergoing abdominal surgery, the neuroaxial blockade and surgical anaesthesia achieved by CSE anaesthesia was associated with decreased post-operative analgesic demands [15].

CSE anaesthesia proved to reduce the pathophysiological response to surgical trauma including; pain, nausea, vomiting and ileus, stress-induced catabolism, impaired pulmonary function, increased cardiac demands and risk of thromboembolism. Therefore, smooth recovery and quicker discharge from hospital could be subsequently achieved [14,15].

In the very unlikely situation, the risk of inadvertent high blockade post-operatively, may be reduced by monitoring the patient's arm movements using the epidural scoring scale for arm movements [ESSAM],which has been found to be very simple and reliable method for the early detection of the cephalad spread of thoracic epidural analgesia [16].

Needless to mention that in the current Coronavirus disease (COVID-19) situation, anaesthetists are required to have heightened precautions and tailor anesthetic practices to individual patients. In particular, by minimizing the many aerosol-generating procedures performed during general anesthesia, anesthesiologists can reduce exposure to patient's respiratory secretions and the risk of perioperative viral transmission to healthcare workers and other patients. To avoid any airway manipulation, regional anesthesia should be considered whenever surgery is planned for a suspect or confirmed COVID-19 patient or any patient who poses an infection risk. Regional anesthesia has benefits of preservation of respiratory function, avoidance of aerosolization and hence viral transmission [17,18].

Given that our elderly heavy smoker patient had COPD, the advantages of the combined epidural anaesthesia techniques may have been vital contributor to the very satisfactory patient's clinical condition during surgery and postoperatively.

Finally, we believe that the combined spinal epidural anaesthesia technique is a very useful flexible technique, especially when it is used for selected patients helping to avoid general anaesthesia when it is contra- indicated. Encouraging this technique might help increasing the safety margin of the surgery offered to the high-risk surgical co-morbid patients, especially those with severe pulmonary diseases. It could also help smooth the recovery period, decreasing the post-operative nursing care and enhance the discharge rate of those patients, increase the turnover of surgical cases and subsequently, shorten the long waiting lists for surgery in the NHS. Also, in the current Covid-19 circumstances, avoiding G.A. and quick discharge from the hospital would be advantageous. Needless to mention that optimum anaesthetic and surgical experience as well as co-operation between the surgical, a aesthetics and nursing staff is necessary in such cases.

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