



# Choice of Neuraxial over General Anesthesia for Incisional Hernia Repair: A Case Report

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## Abstract

**Background:** Incisional hernias usually developed from the former postoperative scar. Surgery is often necessary to push the protruding tissue back in place, remove any scar, and adhere to a surgical mesh to prevent recurrence. Open ventral repair is often performed under general anaesthesia but can also be done under neuraxial anesthesia. **Case Report:** We report a case of a 59-year-old female, ASA 2 for Obesity (BMI 31 kg/m<sup>2</sup>), Hypertension, Type 2 Diabetes Mellitus non-insulin requiring, and Bronchial asthma not in acute exacerbation, who presented with a 9-month history of periumbilical bulge more prominent upon standing up and straining. Patient underwent mesh repair of incisional under neuraxial anaesthesia due to associated co-morbidities. **Conclusion:** While most would do the case under general anaesthesia, neuraxial anesthesia offers a more reasonable anesthetic plan, especially in patients presenting with different comorbidities. **Novel Aspects:** Neuraxial anesthesia for incisional hernia repair is feasible and offers less airway manipulation and opioid requirements. Avoiding intubation and muscle relaxant in the setting of morbidly obese and asthmatic patients allow better and enhanced postoperative respiratory recovery with optimal pain control.

## Subject Areas

Anaesthesiology & Pain Management, Clinical Medicine, Surgery & Surgical Specialties

## Keywords

Hernia, Neuraxial Anesthesia, Surgical Repair, General Anesthesia

## 1. Introduction

Hernia occurs when an organ or an internal part of the body pushes through an

opening in the muscle or tissue. It occurs when there is a weakness or hole in the muscular wall that usually supports it. It can either be reducible or irreducible. In a reducible hernia, the contents of the sac return to the abdomen spontaneously or with manual pressure. In comparison with irreducible, the contents fail to return to the abdomen [1]. There are different types of hernias, depending on its location. A ventral (abdominal) hernia refers to any protrusion of intestine or other tissue through a weakness or gap in the abdominal wall. Specific types of ventral hernias include Umbilical and Incisional hernias [2]. It can be asymptomatic but is often associated with complications such as pain, abdominal discomfort and obstruction, and incarceration [3]. Risk factors in developing incisional hernia include poor surgical technique, postoperative wound infection, smoker's cough, and co-morbidities such as Diabetes and Obesity.

The type of anesthesia depends on many factors, such as the size, location, and the associated symptoms. Several literatures focused on the use of general anesthesia in managing this type of case, but few employed the use of neuraxial anesthesia. This case report focused on the use of neuraxial anesthesia in the setting of incisional hernia repair.

## 2. Case Description

We have a 59-year-old female, ASA 2 for Hypertension, controlled and maintained on Losartan 50 mg once a day, Type 2 diabetes mellitus non-insulin requiring, controlled and maintained as well on Metformin 500 mg once a day, Bronchial asthma not in acute exacerbation maintained on Salmeterol + Fluticasone propionate as needed, and Obesity (BMI 31.6 kg/m<sup>2</sup>), who underwent Exploratory laparotomy, Total Hysterectomy with Bilateral Salpingo-oophorectomy last 2019 for post-menopausal bleeding from Myoma Uteri. She came in with a 9-month history of a periumbilical bulge more prominent upon standing up and straining which was accompanied by constipation. Abdominal CT scan showed a 2x2 cm defect and reducible periumbilical hernia, hence she was admitted for surgery. The Mallampati score of the patient was 3, visualizing only the soft palate and base of the uvula. This categorizes the patient as possibly having difficulty mask ventilation [4]. Due to the associated comorbidities, difficult airway, and the anticipation for possible long surgery, combined spinal and epidural anesthesia at L3-L4 level was performed with an 18 G Tuohy needle and 25 G spinal needle. A single bolus of 15 mg hyperbaric bupivacaine into the subarachnoid space was injected and was supported two hours into the surgery with 20 mL loading dose of Lidocaine 2% + Epinephrine 1:200,000 via the epidural catheter.

The surgical procedure was done under non-invasive monitors, with an adult Hudson face mask for oxygen support. A midline incision was carried down up to the subcutaneous layer. Intraoperatively, an incarcerated viable omentum with segment of small bowel adherent to the preperitoneal fat was found. This was repaired with a 15 × 15 cm mesh placed retromuscularly.

At the Post-Anesthesia Care Unit, the patient was noted to have difficulty

breathing with wheezes, although no desaturations occurred, and vital signs were stable. Change in environmental temperature was a known trigger for the patient. This was resolved by giving her a salbutamol nebulizer.

The patient was then eventually transferred to the ward. Analgesia with Bupivacaine 0.125% + Morphine sulfate 0.02 mg 10 cc every 12 hours for 4 doses via epidural catheter was administered until postoperative day (POD) 2. Pain control was good, with a numerical rating scale of 2 - 3/10. Bowel movements returned on POD 3 and no postoperative headache occurred. The patient was then discharged on POD 5 with no further complications.

### 3. Discussion

Hernia repairs are one of the most performed surgical procedures, with Incisional hernia as the most frequent surgical complication following laparotomy [1]. Most often, it is done under general anesthesia. However, its side effects should be considered, especially in patients with compromised pulmonary and cardiovascular function [5]. In an informal survey done among the anesthesia residents of the University of the Philippines—Philippine General Hospital, the anesthetic choice of doing the incisional hernia repair still depends on the comorbidities of the patient and the current clinical status—obstructive symptoms, size of defect, etc. However, preference to do it under general anesthesia is more prevalent than neuraxial.

But, if there are no contraindications, neuraxial anesthesia is a relatively simple technique that is safe and better, especially in patients who are cooperative during the procedure. It also provides good pain control, reduced anesthetic requirements and airway manipulation, and more rapid postoperative recovery [6].

Morbid obesity also poses a great challenge due to difficulty in airway management and presence of overt or occult cardiorespiratory compromise [7]. It also increases the risk of gastric aspiration under general anesthesia. Difficult intubation and rapid desaturation may be expected from these patients due to their anatomic and physiologic differences and that risk of postoperative complications such as hypoxemia, pulmonary atelectasis may be high [8] [9]. Opioid analgesia may also be dangerous, especially those with Obstructive Sleep Apnea [9]. In contrast with regional anesthesia, opioid requirements are much lesser compared to general anesthesia.

Asthma is a chronic, reversible, inflammatory disease that develops to airway obstruction brought by bronchoconstriction, airway thickening due to mucosal edema, increased airway secretions as well as inflammation [10]. Perioperative respiratory complications usually happen during induction of general anesthesia, intubation, and emergence; hence, it is prudent to avoid manipulation of airway since anesthetic goals include avoidance of bronchospasm and ensuring patient safety and comfort [11].

There are limited reports on the use of neuraxial anesthesia for ventral hernia repairs especially in morbidly obese patients. An open surgical technique under neuraxial anesthesia was preferred to avoid endotracheal intubation that may have

led to difficulty weaning the patient from the ventilator.

In the meta-analysis and systematic review done by Li, *et al.* [12], they compared spinal anesthesia (SA) vs general anesthesia (GA) in inguinal hernia repairs. Results showed that postoperative pain control and nausea and vomiting were much better with the SA group, leading to early mobilization and decreased rescue medications. Although complications such as more urinary retention were higher in SA group. It was also found that patients under regional anesthesia had lower systolic and diastolic pressure mean pressure values, with hypotension that was responsive to fluid boluses [12] [13].

In another study by Pierce, *et al.*, they compared the efficiency of spinal versus general anesthesia for lumbar spinal surgery. Results showed that both groups had approximately equal changes in terms of blood pressure, Mean Arterial Pressure and even incidence of nausea and/or vomiting. Mean operative time, anesthesia time, and blood loss were higher in GA group, but the mean Post-Anesthesia Care Unit time was longer in SA groups [14].

Postoperative pain and Gut paralysis are one of the most common complications after ventral hernia repair due to the extensive adhesiolysis and dissection of abdominal wall. In the study done by Melland-Smith, *et al.*, a total of 2570 patients who underwent ventral hernia repair were included and randomized into two groups—420 patients had an epidural and 2150 did not. Results showed that discontinuation of epidural analgesia was associated with a 9-fold increase in ileus rates, signifying the advantage of using epidural anesthesia in limiting postoperative opioid use and, therefore, reducing risk of ileus [15].

Abdominal wall surgeries can be done under neuraxial anesthesia, either by epidural, spinal, or combined epidural-spinal technique. It provides adequate anesthesia and analgesia with relatively fewer anesthetic drugs [12].

## 4. Conclusion

Repair of hernia can be done under neuraxial anesthesia because it provides adequate anesthesia and is a good alternative for patients who are at high risk for general anesthesia. It also proved to be effective in providing optimal analgesia, rapid recovery phase, and patient and surgeon comfort. Considering all these things, this may suggest that neuraxial anesthesia may be more cost-effective most of the time.

## Informed Consent

Physical signed copy is available upon request.

## Conflicts of Interest

The authors declare no conflicts of interest.

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