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Epidural Anesthesia Management for Unilateral Salpingo-Oophorectomy in Patients with Ovarian Mass : A Case Report

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ABSTRACT

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Background: Epidural anesthesia was needed in some gynecological operations combined with sedation and mainly used in elderly patients or those with medical problems, including those who had ovarian mass. Epidural administration of amide local anesthetics in combination with opioids is widely used for pain relief because of the dose minimizing and side effects reducing benefits.

Case: Patient was diagnosed with ovarian mass. The patient also had pleural effusion, ascites, and hypoalbuminemia. Epidural anesthesia used in this patient as a resource for perioperative and postoperative pain management.

Discussion: Patient underwent unilateral salpingo-oophorectomy for her ovarian mass. Anesthetic doses were given carefully due to patient conditions with pleural effusion and ascites. Opioid and Neuromuscular Blocking Agents (NMBAs) effects were absolutely decreased due to hypoalbuminemia, but were overcome with Naloxone and Sugammadex. Epidural anesthesia used to stabilize the drugs and pain management for this patient.

Conclusion: Epidural anesthesia is an excellent choice for unilateral salpingo-oophorectomy in patients with ovarian mass. It has been proven to provide excellent pain control after major surgeries and may be associated with a lower incidence of postoperative complications.

Keywords: Epidural anesthesia, Unilateral salpingo-oophorectomy, Ovarian mass

Introduction

Regional anesthesia is a specific technique that temporarily inhibits nerve conduction and pain senses in certain regions of the body with local anesthetic medication without causing loss of consciousness to avoid or relieve pain. Regional anesthesia (RA) reduces acute pain, chronic pain after some surgical procedures, postoperative nausea and vomiting, and pulmonary complications. Additionally, due to the increase in the use of ultrasonography, currently, regional anesthesia techniques are performed more reliably and effectively.¹

There were 3 types of regional anesthesia including spinal and epidural anesthesia, nerve blocks, and intravenous regional anesthesia. Epidural anesthesia was needed in some gynecological operations combined with sedation and mainly used in elderly patients or those with medical problems, including those who had ovarian mass.² It may also be used at patient request if the surgery is suitable for this form of anesthesia. Epidurals may be combined with General Anaesthesia in major cases for postoperative pain management. Epidural administration of amide local anesthetics in combination with opioids is widely used for pain relief in labor because of the dose minimizing and side effects reducing benefits.³ Bupivacaine is the most widely used long-acting amide local anesthetic.

Intravenous non opioid anesthetics have an important role in modern anesthesia practice. They are widely used to facilitate a rapid induction of general anesthesia and provide sedation during monitored anesthesia care (MAC) and for patients in intensive care settings. With the introduction of propofol, intravenous techniques are increasingly being used for maintenance of anesthesia.⁴ However, similar to inhaled

anesthetics, the currently available intravenous drugs do not produce only desirable effects. Therefore, the concept of "balanced anesthesia" evolved by using smaller doses of multiple drugs rather than using larger doses with one or two drugs.⁵ The fundamental drugs used with "balanced anesthesia" include inhaled anesthetics, sedative/hypnotics, opioids, and neuromuscular blocking drugs such as propofol, fentanyl, and rocuronium combination.

Opioid overdose and mortality have increased at an alarming rate prompting new public health initiatives to reduce drug poisoning. One initiative is to expand access to the opioid antidote naloxone. Naloxone has a long history of safe and effective use by organized healthcare systems and providers in the treatment of opioid overdose by paramedics/emergency medicine technicians, emergency medicine physicians and anesthesiologists.⁶ Sugammadex is the first clinical representative of a new class of drugs called selective relaxant binding agents. It has revolutionized the way anesthesiologists think about drug reversal.⁷ Sugammadex selectively binds rocuronium, thereby reversing their neuromuscular blocking action. Due to its 1:1 binding of rocuronium, it is able to reverse any depth of the neuromuscular block. We report a case with regional anesthesia in an oncology-gynecology patient.

Case

A 58-year-old woman with height 145 cm, weight 40 kg, and Body Mass Index (BMI) - 18 kg/m² came with complaints of abdominal pain with mass enlargement and dyspnea during supine position. Patient diagnosed with ovarian cyst neoplasm, pleural effusion, and ascites. The patient had a history of

ringer lactate 20 drops per minute, ranitidine injection 1 amp/12 hours, ketorolac 1 amp/8 hours, and albumin correction 25% 100 cc medication. Patient looks good with composmentis consciousness (GCS E4V5M6), blood pressure 130/80, pulse 89x/minute, respiratory rate 20x/minute, body temperature afebrile, oxygen saturation 98% room air. From the physical examination, it was found that the mouth was mallampati II with 3 fingers open, loose teeth (+), normal basic vesicular sound, abdominal dullness, and both leg edema. Lab examinations showed low hemoglobin (10,7 g/dL), high thrombocyte ($885 \times 10^3/\mu\text{l}$), and low albumin (2,4 g/dL). Laboratory investigation results showed no other abnormalities. No malignant cells on ascites

puncture pathology. Negative for intraepithelial lesion or malignancy (NILM), atrophic smear. On thoracic x-ray showed no heart enlargement, no infiltrate or nodule, and left pleural effusion. On abdominal USG with uterine view 3,96 x 3,90 x 3,54, with 28,55 cc volume, EL +0,13. Regular texture homogenous contour. A hypo hyperechoic lesion appears in the adnexal septum 6,31 x 5,24 x 8,54 with 147 cc volume and no neovascularization, partition thickness 0,31 cm, cyst wall thickness 0,13 cm, free fluid is seen in the Morrison Pouch. On 3 position BNO examination showed no ileus or pneumoperitoneum was seen, ground glass opacity on the right and left hemiabdomen accompanied by centration of intestinal loops, tends to an ascites.



Figure 1. Patients' physical examination

maintenance of adequate hepatic blood flow and oxygen delivery. Relative hypoperfusion or hypoxaemia may produce further hepatocellular injury and result in decompensation. In the presence of portal hypertension, hepatic blood supply is dependent on hepatic arterial blood flow. All forms of anesthesia can reduce mean arterial pressure and thereby reduce hepatic blood flow.⁸ Other intraoperative factors which can reduce hepatic blood flow include surgical traction on the liver, positive pressure ventilation, hypocapnia, alpha-adrenoceptor agonists. In this case the patient underwent laparoscopic surgery which also reduced hepatic blood flow.

The choice of drugs for anesthesia induction and maintenance is less important than the care with which they are used. A suggested technique is i.v. induction of anesthesia using propofol and remifentanyl, in most cases using a modified rapid sequence induction with cricoid pressure and rocuronium 1 mg kg⁻¹, followed by maintenance with oxygen/air/desflurane and remifentanyl infusion.¹² From the case i.v. induction of anesthesia using propofol 70 mg, rocuronium 30 mg, fentanyl 100 mcg, dexamethasone 10 mg followed intraoperatively by rocuronium 10 mg, fentanyl 50 mcg. Propofol clearance is not significantly impaired by liver disease. Ventilation is controlled to maintain arterial PCO_2 between 4.5 and 5.3 kPa. Appropriate antibiotic prophylaxis is required before surgery.

Large-bore i.v. access is mandatory. All fluids should be administered via a fluid warming device and access to a rapid infusion device is important for all major surgery. Fluid replacement should be guided by cardiovascular variables, blood loss, and urine output; only when cardiac filling

pressures are optimized should vasopressors such as metaraminol, phenylephrine, or norepinephrine be considered for the treatment of hypotension.¹³ Maintenance of intravascular fluid volume and appropriate cardiovascular management are critical to achieve an adequate urine output; however, loop diuretics or mannitol are occasionally used.¹⁴ Crystalloid solutions may be less effective than colloids in the presence of ascites, but a background infusion of 5–10% dextrose at 50–100 ml h⁻¹ helps to avoid hypoglycaemia and protect against inadvertent increases in plasma sodium concentration.¹⁵ Fortunately, this case was using colloids including 500 mL Gelofusin, 1000 mL Ringer Lactate, 500 mL NaCl 0,9%, and her urine output was 200 mL.

I.V. patient-controlled analgesia using fentanyl is well tolerated in patients with compensated liver disease. A regimen of a fentanyl bolus of 10 µg with a lockout time of 10 min and no background infusion is effective. Regional analgesia may be very useful in reducing the need for systemic analgesia, but attention to coagulation status is essential. Epidural analgesia should be considered with extreme caution only if INR is <1.5 and platelet count is >100 000 mm⁻³.¹⁶ This case using bupivacaine 0,125% 3 mL as regional anesthesia. Coagulation function showed no abnormalities, but platelet count is >100 000 mm⁻³.

Albumin is synthesized in the liver, and its synthesis may be decreased in liver disease. Low plasma albumin concentration results in decreased volume of distribution of some anesthetic drugs. Hypoalbuminemia is also associated with decreased plasma volume. A function of drug concentration is unbound at condition because it will determine the good pharmacological effect of both efficacy and

toxicity because it is only a drug.¹⁷ Those that are not bound to protein are able to penetrate the membrane and reach the target site. In a state of hypoalbuminemia fraction unbound drugs will generally increase.¹⁸ This patient was hypoalbuminemia which affected decreased volume of distribution of some anesthetic drugs, but sugammadex was given to overcome the condition. Sugammadex is a selective relaxant binding agent indicated for the reversal of moderate to deep NMB, with a high affinity for rocuronium. Sugammadex encapsulates neuromuscular blocking agents (e.g., rocuronium), inactivating them, resulting in the reversal of the NMB.¹⁹

Perioperative optimization of patient care remains challenging due to many factors such as coexisting morbidities, progression of cancer disease, and an increasing number of elderly patients undergoing surgeries. A multimodal approach is required to provide an enhanced recovery pathway and improve patient outcomes. For years, general anesthesia with traditional opioid-based analgesia was the only option for most gynecological and breast oncology surgeries. The advances in anesthesiology and the development of novel RA techniques have provided an opportunity to tailor an individual analgesic plan to the patient and the surgery.²⁰ Regional anesthesia aims to provide selective, reversible sensation loss in a specific body part. It is a crucial element in the multimodal anesthetic management of many types of surgery. In parallel, with the increasing availability of ultrasonography, it has stopped being an arcane art limited to a narrow group of anesthesiologists. What has begun as a simple method of numbing body parts has evolved into a highly selective blockade of neural structures. Bupivacaine was the best selection for regional

anesthesia.

Epidural anesthesia has been proven to provide excellent pain control after major surgeries and may be associated with a lower incidence of postoperative complications. A meta-analysis of 125 studies reported that epidural anesthesia reduces postoperative mortality and improves cardiovascular, respiratory, and gastrointestinal morbidity endpoints compared to systemic analgesia. However, this technique may be associated with side effects such as hypotension, urinary retention, and pruritus.²¹ The study by Huepenbecker has shed more light on epidural anesthesia in gynecologic oncologic patients. The work compared the incidence of postoperative complications and opioid use after exploratory laparotomy with and without epidural anesthesia. The results confirmed improved pain control, shorter hospitalizations, no difference in venous thromboembolism, lower wound complications but more prolonged urinary catheter use, and higher postoperative hypotension.²² Although epidural anesthesia is considered the cornerstone in ERAS pathways, its role is currently questioned. This neuraxial technique is beneficial in general, but it has some limitations. It is contraindicated in patients on anticoagulants, coagulation disorders, or hemodynamic instability. The incidence of severe complications is rare, including troublesome events such as epidural hematoma, epidural abscess, or postoperative neurologic deficits. In the laparoscopic technique, the surgical approach is less invasive; incisional pain is lower than open surgery and does not require such extensive analgesic methods. The specific context is essential to calculating the risk benefit ratio. The development of novel, easy-to-perform, increasingly safe, and

comparably efficient regional techniques makes epidural anesthesia less and less popular.

Conclusion

Epidural anesthesia is an excellent choice for unilateral salpingo-oophorectomy in patients with ovarian mass. It has been proven to provide excellent pain control after major surgeries and may be associated with a lower incidence of postoperative complications.

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