Open Cholecystectomy Under Epidural Anesthesia in a Patient Who Developed Septic Shock with Heart Failure and Respiratory Distress -
A Case Report

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Abstract

Introduction

For decades, the management of symptomatic cholelithiasis in high surgical risk patients has remained contentious. Cholecystectomy has become firmly established as a procedure of choice in the management of symptomatic cholelithiasis. The procedure usually necessitates general anesthesia and endotracheal intubation to prevent aspiration and respiratory embarrassment secondary to the induction of pneumoperitoneum.

Open cholecystectomy (OC) usually necessitates general anesthesia and endotracheal intubation to prevent aspiration and respiratory embarrassment. We report our preliminary experience with open cholecystectomy using epidural anesthesia in patients with cardiac failure and septic shock.

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Case

An 82-year-old woman (weight 55 kg, height 152 cm) with abdominal pain applied to the emergency department. After general surgery and infectious disease consultations, he was admitted to the intensive care unit because of high infection parameters and general condition disorder (WBC =17,32). He had a history of frequent pain at the right hypochondriac region with ultrasonography-documented calculi in the gallbladder for two years and heart failure.

With the patient at the right lateral decubitus position, EA was performed with a 20-G epidural catheter inserted 4cm towards the cephalad-direction from L4/L5 successfully.

After completion of the surgical procedure, the epidural catheter was removed, and the patient was shifted to the post-anesthesia care unit (PACU) for further observation. The patient remained hemodynamically stable and comfortable during the 1 hour at PACU.

Conclusion

In this case report, we wanted to demonstrate the management of an emergency case with epidemic anesthesia, with a general condition of poor heart failure and septic shock.

Keywords: Epidural anesthesia, Open cholecystectomy, Sepsis.
INTRODUCTION

For decades, the management of symptomatic cholelithiasis in high surgical risk patients has remained contentious. Cholecystectomy has become firmly established as a procedure of choice in the management of symptomatic cholelithiasis. The procedure usually necessitates general anaesthesia and endotracheal intubation to prevent aspiration and respiratory embarrassment secondary to the induction of pneumoperitoneum(1). There have been several case reports of successful laparoscopic cholecystectomy performed under spinal anaesthesia(2). However, little has been reported about the possibility of performing the procedure under regional anaesthesia in patients with significant pulmonary disease(3).

It is generally agreed that the condition is best managed conservatively and that surgical intervention should be reserved for patients who fail to respond or develop complications. Open cholecystectomy (OC) usually necessitates general anaesthesia and endotracheal intubation to prevent aspiration and respiratory embarrassment(4).

The goal of anaesthesia management in these patients should include avoidance of anaesthetics that depress mucociliary transport, provision of postoperative pain relief adequate to prevent deterioration of respiratory mechanics, and ambulation as early as possible. Epidural anaesthesia fulfills all of the above criteria and aids in the quick and uneventful postoperative recovery of these patients (5).

With the advent of OC and anaesthetic techniques such as epidural blockage, we have another option that may be safe for many of these patients. We report our preliminary experience with open cholecystectomy using epidural anaesthesia in patients with cardiac failure and septic shock.

1. CASE

An 82-year-old woman (55 kg, 152 cm) with abdominal pain applied to the emergency department. After general surgery and infectious disease consultations, he was admitted to the intensive care unit because of high infection parameter (WBC =17,32 m/mm3) and general condition disorder. She had a history of frequent pain at the right hypochondriac region and she complained a calculi in the gallbladder for two years and heart failure.
Medical treatment for the diseases accompanying the patient was planned. She was before accepted to the general surgery clinic. When the patient was diagnosed as a sepsis condition during follow-up, she was taken to emergency surgery for resource control. Her routine investigations were within a normal range such as her chest X-ray and electrocardiogram.

Three days after the admission in emergency department, the patient began to observe an increase of infection parameter (WBC). A new chest X-ray revealed cardiomegaly, and an ECG of Q-T interval was observed. After the consultations, it was determined that the source of infection was gall bladder in case of newly formed sepsis. It was decided to perform an emergency gall bladder operation to regress the existing infection.

The patient was not cooperated and not orientated when he came to the operation room. The patient was a stuporous. On patients’ arrival at the operation room, an intravenous (IV) cannula and central catheter were already present. We inserted radial artery cannulation and arterial monitoring for the sepsis-induced hypotensive condition. And then, electrocardiogram, noninvasive blood pressure, and pulse oximetry (SpO2) were monitored and recorded. The initial blood pressure (BP) was mmHg 114/77 (with noradrenaline (1mcg/kg/min), and the heart rate (HR) was 103 beats/min, oxygen value was 6L/min with a facemask. Preoxygenation was performed to bring the patient to the optimum conditions. The baseline SpO2 was 88%, although the patient was given oxygen with 6 lt/ min. We planned to perform epidural anesthesia for the patient due to heart failure and respiratory distress. Saline (4-6 ml/kg) was infused before giving epidural anesthesia because of the heart failure. With the patient at the right lateral decubitus position, EA was performed with a 20-G epidural catheter inserted 4cm towards the cephalad-direction from L4/L5 successfully.
Then the patient was placed in the supine position. A test dose of 3 ml of 2% lidocaine was injected through the epidural catheter. There was no evidence of intravascular or intrathecal injection for up to 5 minutes. And then, an additional 20 cc (10 ml isobaric bupivacaine, 9 ml prilocaine, 1 ml fentanyl) was injected. Fifteen minutes later, sensory (pinprick) blockade was established from T4 to L1, and motor block (modified Bromage scale 1-inability to raise extended legs/can bend the knee) was achieved, which was accepted to allow surgery. At this point, the BP was 64/45 mmHg, and the HR was 88 beats/min. The dose of noradrenaline was increased due to low blood pressure. During this period, the patient received a saline solution. The patient was mildly given analgesic (ketalar 1 mg/kg) and breathed spontaneously without difficulty. Then open cholecystectomy was started. An 8 cm Kocher
incision was made right subcostal. When the patient feels pain after insertion of the liver, another 5ml 0.5% prilocaine was injected through the epidural catheter. Intravenous ketalar (1 mg/kg) were given. When the patient felt pain at the 30th minute of the surgical procedure, ketalar (0.5 mg/kg) was administered again. The patients’ BP and HR decreased abruptly to 75/51mmHg and 56 beats /min, respectively. The BP and HR increased to 108/60 mmHg after pushing of 5 mg ephedrine IV. The gallbladder was removed uneventfully, and the total surgical time was 57 minutes (Figure 2).

Figure 2: The gallbladder removed after operation, approximately 10 cm in size.

After completion of the surgical procedure, the epidural catheter was removed, and the patient was transferred to the post-anesthesia care unit (PACU) for further observation. The patient remained hemodynamically stable and comfortable during the 1 hour at PACU. The patient was followed up for three days in a general surgery intensive care unit. Paracetamol and tramadol were used as postoperative analgesics. During the follow-up of the patient, infection parameter regressed (WBC) but respiratory distress developed. Therefore, the
patient was intubated on the 2nd day of postoperative follow-up. The patient died on the 4th
day of postoperative follow-up in the intensive care unit.

2. DISCUSSION

General anesthesia is usually employed for open cholecystectomy as it provides adequate
surgical relaxation for the surgery and usually more acceptable to the surgical colleagues by
convention. However, it can lead to a number of complications if the patients suffering from
co-morbid conditions. In our case, we tried to perform the management of epidural
anesthesia in open cholecystectomy surgery patient.

Regional anesthesia in abdominal surgeries, especially upper abdominal surgeries, is usually
not preferred by most of the surgical colleagues because first they are not accustomed to
operate under this type of anaesthesia and second because of the delay associated with
institution of this technique, hence an aspiring anaesthetist fails to establish these techniques
into his/her practice as routine(6). Many retrospective, prospective, and meta-analysis
studies have demonstrated an improvement in surgical outcome of EA through beneficial
effects on peri-operative pulmonary function, blunting the surgical stress response and
improved analgesia. In particular, significant reduction in perioperative cardiac morbidity
(∼30%), pulmonary infections (∼40%), pulmonary embolism (∼50%), ileus (∼2 days), acute
renal failure (∼30%), and blood loss (∼30%) as well as beneficial effects on immune system,
cognition and prevention of peri and postoperative stress have been widely highlighted in
the review of the literature carried out by us(7). Despite all these above mentioned
advantages.

Sepsis is a systemic inflammatory response following bacterial infection. Cardiac
dysfunction is one of the inevitable consequences of sepsis affecting mortality. The
mechanism of this cardiac dysfunction is due to increased inflammation and depletion of
ATP as a result of the suppression of fatty acid and glucose oxidation. Also, cardiac
adrenergic effects are compromised in septic patients and may result in unexpected over-
effects of adrenaline(8).

In this context, postoperative acute myocardial infarction (AMI) is the most common cause
of postoperative morbidity, and mortality. Due to the effect of GA, it may not be very easy
to recognize. Early diagnosis and treatment may reduce the morbidity and mortality of this fatal complication. In this study (9), a 56-year-old woman with a planned nephrectomy is presented. Acute inferoposterior myocardial infarction occurred after induction of general anesthesia, and coronary angiography showed that the proximal portion of the circumflex coronary artery (Cx) was occluded by thrombus, and the left anterior descending coronary artery and right coronary artery were plaques. Percutaneous transluminal coronary angioplasty and stent resulted in successful dilation of Cx and was discharged on the fifth day of the intervention without any complications. General anesthesia is a disadvantage in deepening the already existing coronary syndrome and increasing the workload and oxygen demand of the heart(9).

We did not want to increase cardiac depression with sepsis condition under general anesthesia.

Severe sepsis or septic shock is a condition caused by an excessive inflammatory response to infectious pathogens. Acute respiratory distress syndrome (ARDS) is a high mortality complication of severe sepsis where patients have high mortality. Timely treatment of underlying sepsis and early diagnosis of patients at risk of ARDS can help reduce mortality (10). In our case, we tried to manage more safely by using regional anesthesia.

General anesthesia reduces the respiratory muscle tone, causing a 0.4-0.5 liter reduction in FRC. Decreased lung volume is accompanied by decreased compliance of the lung and increased resistance. GA also causes decreased compliance of lung tissue and possibly airway closure in dependent areas. Therefore, excessive use of oxygen during anesthesia can increase the safety margin during induction, but may then contribute to impaired oxygenation during anesthesia and in the postoperative period, causing atelectasis formation(11). In our patient with respiratory distress caused by both sepsis and heart failure, we found it appropriate to perform anesthesia with epidural anesthesia because of the risk that general anesthesia may further increase this condition.

In this case, as a limitation, during the operation, CPAP could be performed to improve respiratory parameters and oxygen delivery to the heart. However, the patient's inadequate consciousness would not provide us with the communication we need in non-invasive ventilation. In addition, the follow-up of our epidural anesthesia catheter could continue in intensive care, but we could’t be sure about using safely in the intensive care unit.
3. CONCLUSIONS

In this case, we wanted to demonstrate the management of an emergency case who had a severe heart failure and septic shock by using epidural anesthesia.
REFERENCES


