General anesthesia of endhotracheal tube in cholesistektomy with cholelithiasis with cholecystitis: a case report

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Abstract. Gallstones can develop in cholelithiasis, a disorder that causes inflammation and symptoms include pain in the upper right abdomen. According to this study, a 33-year-old lady has experienced periodic nausea and recurrent upper right abdomen pain for a number of years. Data for a descriptive case study were gathered by closely observing and tracking hemodynamic reactions while under anesthesia. Laboratory testing, ultrasonography, and a physical examination were used to confirm the diagnosis of cholelithiasis. Under general anesthesia and endotracheal intubation, the patient had a cholecystectomy. In addition to fentanyl for analgesia, pre-anesthesia preparation contained ondansetron and atropine to prevent bradycardia and nausea. Fentanyl, propofol, and rocuronium were used for induction, while fentanyl, ibuprofen, and vitamin C were used for postoperative pain control. With the proper anesthetic modifications, the patient stayed steady throughout the procedure. Tramadol and a heated blanket were used to treat postoperative shivering, whereas 3% sevoflurane was used to preserve consciousness. The patient was prepared for transfer to the inpatient ward, as indicated by their aldrete score of 9. This study finds that endotracheal intubation combined with general anesthesia works well for cholecystectomy in individuals with cholelithiasis. A multimodal approach to pain and shivering control, along with proper anesthetic management, guarantees hemodynamic stability, reduces discomfort, and promotes a quicker recovery.

1 Introduction

Cholelithiasis or gallstones is a disease characterized by sudden abdominal pain due to the formation of stones in the gallbladder. The gallbladder is a small sac filled with bile, a digestive fluid produced by the liver to break down and digest fat. Gallstones are small stone-like objects found in the gallbladder, but gallstone disease is also known in medical terms as cholelithiasis [1].

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The high incidence of cholelithiasis increases the incidence of gallbladder lesions such as acute cholecystitis, which is 47% in cirrhosis patients and 14.7% in patients without cirrhosis [2]. Pain is a problem that often appears in cholelithiasis. Of people with cholelithiasis, 1% to 2% will experience complications. About 5% to 15% undergo cholecystectomy [3]. General anesthesia is preferred for this procedure because of its ability to provide total unconsciousness and muscle relaxation, facilitating optimal surgical access and minimizing patient discomfort during surgery [4].

General anesthesia commonly known as general anesthesia is an agent that is unique in clinical medicine because it is the only drug that causes unconsciousness for therapeutic purposes, general anesthesia can affect the central nervous system through general mechanisms [5]. An endotracheal tube is a tube or tube made of polyvinyl chloride that is attached through the trachea between the vocal cords, endotracheal tube supplies oxygen and inhaled gases to the lungs and can also protect against contamination such as stomach and blood contents [6]. This study makes a significant contribution to managing patients with cholelithiasis undergoing cholecystectomy, especially in the context of anesthesiology. By emphasizing the importance of adjusting the dose of anesthesia to avoid awareness, this study guides safer clinical practice. In addition, a multimodal approach in postoperative pain management, which incorporates analgesics such as fentanyl and ibuprofen, shows improved patient comfort and accelerates recovery. Treatment of post-anesthesia shivering with a warm blanket and tramadol provides new insights for addressing hypothermia, while using the Aldrete score as a patient recovery evaluation tool offers a measurable method for assessing the success of anesthesia. The research contribution also serves as a source of information for medical education, raising awareness about the complexity and need for individualization in patient care, and potentially improving the standard of anesthesiology practice and clinical outcomes for patients. The study aims to enhance the management of cholelithiasis patients undergoing cholecystectomy, focusing on anesthesia dosage adjustments to prevent intraoperative awareness, multimodal analgesics for postoperative pain, and recovery assessment using the Aldrete score.

1.1 Research Methods

1.1.1 Research design

This study used a descriptive case study design to document the clinical presentation, diagnosis, and management of patients with cholelithiasis.

1.1.2 Research subjects

The study subject was a 33-year-old woman who came to the hospital with complaints of upper right abdominal pain and nausea that appeared gone afloat over the past few years.

1.1.3 Research location

This research was conducted in the operating room of dr. R. Goeteng Taroenadibrata Hospital in September 2024.

1.1.4 Instrument research

The research instrument includes an initial patient observation sheet, an anesthesia procedure observation sheet, and a postoperative observation sheet.

1.1.5 Data collection procedures

Data collection was carried out by direct observation during the anesthesia process. The information recorded includes the patient's initial condition, surgical procedures performed, and observed outcomes after surgery. Emphasis on monitoring the patient's hemodynamic response during and after anesthesia such as blood pressure, heart rate, and oxygen saturation.

2 Case Reports

A 33-year-old woman weighing 50 kg came with complaints of pain in the upper right abdomen that disappeared for years, sometimes nausea. Pain increases when doing activities, discomforts such as stabbing, pain in the upper right abdomen with a pain scale of 6, and recurrent pain disappears for years. Patients diagnosed with cholelithiasis are planned to undergo a cholecystectomy. History of allergies (-), history of routine treatment (-), history of disease (-). The patient has been fasted for 8 hours. Bad habits such as smoking (-). The general condition of the patient of mental compos consciousness, hemodynamic status blood pressure 146/91 mmHg, pulse 110x/min, MAP 109 mmHg, RR 22x/min, Temperature 36.50 C. Pre-anesthesia examination, mallampati score 1, vesicular breath sounds, conjunctiva anemis (-), CRT 2 seconds, cardiac boundaries within normal limits, single BJ I, single BJ II, BJ III (-), gallop rhythm (-), murmur (-), plegia (-), parese (-), free mobility, active ROM, edema (-). Laboratory examination results showed eosinopenia (0%), neutropenia (48%), lymphocytosis (48%), and GDS 134.3. The results of the ultrasound examination of cholelithiasis multiple with the largest size of 9.1 mm accompanied by cholecystitis at Figure 1. Photo of thorax within normal limits at Figure 2.

Abnormal result:
The examination shows low eosinophils at 0% (normal 1-3%), which may indicate a reduced response to allergies or specific infections. Segment neutrophils are also low at 48% (normal 50-70%), possibly suggesting a viral infection or an immune system disturbance. Additionally, lymphocytes are elevated at 48% (normal 25-40%), which may indicate a viral infection or the body’s immune response to certain conditions.

Considering the anesthesia of the physical status of ASA II patients, it was decided to undergo cholesistektomy with general anesthesia intubation using a non-kinking endhotracheal tube, the prognosis is generally good with a low risk of complication.

Tabel 1. Blood Laboratory Supporting Examination

Examination		Result	Normal Value	Unit
HAEMATOLOGY Routine blood				
Leukocyte		10,3	4,8-10,8	10^3/uL
Erythrocyte		4.9	3,8-5.2	10^6uL
Hemoglobin		14.3	11.5-19.5	g/dL
Hematocrit		29	26-54	%
Platelets		333	150-450	Ul
MCV		56	80-100	Fl
MCH		29	26-34	Pg
MCHC		34	32-36	g/dL
Eosinophils	L	0	1-3	%
Segment Netrophile	L	48	50-70	%
Lymphocytes	H	48	25-40	%
Urea		20.0	10-50	mg/dl
Urea		0.85	0.60-1.10	mg/dl
Creatinine				
Bilirubin Direk				
Bilirubin direct		0.13	< 1,2	mg/dl
Indirek bilirubin		0.3	< 0.25	mg/dl
Total Bilirubin		0.40	< 1.0	mg/dl
KIMI CLINIC Blood glucose				
Current glucose		134.3	60-150	mg/dl

Figure 1. USG Abdomen

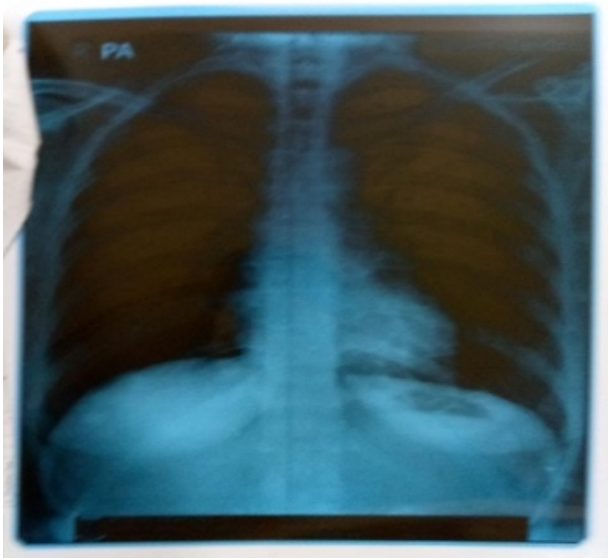

Figure 2. CT Scan Thorax

2.1 Management of Pre-Anesthesia

The patient entered the operating room at 10.45 am. The patient had an IV line installed in his left hand measuring 20G and was given antiemetic preremediation ondansetron 4 mg and anticholinergic atropine sulfate 0.25 mg. The patient complained of pain in the upper right abdomen with a pain scale of 6, the patient's pain increased when moving, pain such as stabbing made it uncomfortable, and disappeared for years. Based on the results of the examination of vital signs, it showed blood pressure of 148/93 mmHg, pulse 110x/min, SpO2 of 98%. Collaboration in the administration of analgetics with anesthesiologists to reduce pain in patients was given fentanyl 25 mcg. After being given analgetic, the NRS pain scale became 5. Results of the examination of vital signs after the administration of analgetics, blood pressure 143/89 mmHg, pulse 109x/min. In pre-anesthesia, pain occurs characterized by the patient's face grimacing in pain.

2.2 Management of Intra-Anesthesia

At 10.50 a.m., the patient entered the operating room, with a blood pressure and oxygen saturation monitor installed. The position of the supine patient, induction of anesthesia starting at 11.00 am was given fentanyl 100 mcg, propofol 100 mg, and rocuronium 20 mg. After oxygenation for 3 minutes, intubation of a 6.5 size non-kinking endotracheal tube with a fixation of 10 cm was performed. Rumatan sevoflurane 2% MAC. N2O to oxygen ratio 50:50 with control ventilator mode. In the first 15 minutes, hemodynamic changes occurred in the patient, showing blood pressure 155/80 mmHg, pulse 105x/min, RR 22x/min, SpO2 99%, and temperature 35.5 $^{0C.}$ Clinical evidence shows that the patient is not in deep sleep, and can move,

but does not feel pain (quite analgetic but not relaxed and hypnotic enough) characterized by movement of the extremity muscles. After increasing the concentration of sevoflurane from 1.5% to 3%, there was a decrease in abdominal muscle contraction characterized by blood pressure of 141/78 mmHg, and pulse 98x/min. The surgery lasted for 75 minutes. Bleeding ± 300 ml. Liquid enters Asering 1000 ml crystalloid. Before the operation is complete. Conscious extubation was carried out, 99% oxygen saturation monitoring and 350 L tidal volume then the patient was transferred to the recovery room. In intra-anesthesia, awareness of anesthesia occurs marked by the patient's cough and upper limb movements.

2.3 Post-Anesthesia Management

At 12.15 p.m., the patient was moved from the operating room to the recovery room. During treatment in the hemodynamic recovery room, respiration was stable, blood pressure 132/84 mmHg, pulse 101x/min, respiratory rate 20x/min, temperature 35.5^0 C. Clinical basis showed that the patient had chills palpably felt the patient's skin was cold, body temperature was 35.5^0 C. At the time of post-anesthesia, the patient's shivering was characterized by the patient looking pale and trembling in the hands. After being given a blanket and collaborating with an anesthesiologist to reduce chills, 50 mg was given. After being given a blanket and tramadol medicine, the shivering decreased. The patient was not fully conscious, breathing assisted by a nasal cannula of 3 L/min. Postoperative pain management was given fentanyl analgesic 100 mcg, ibuprofen 800 mg, and vitamin C in tutosol 20 tpm. The patient was transferred to the inpatient room at 1 2.45 after an Aldrete score was assessed: 9.

3 Discussion

Gallstone infections and gallstone complications are common clinical problems. Clinical manifestations vary between asymptomatic attacks and biliary pain attacks that often require elective or emergency treatment. The pain is accompanied by vomiting and usually goes away on its own, but it can also be accompanied by other symptoms, indigestion, and flatulence. If biliary pain persists for more than 12 hours, then acute cholelithiasis is accompanied by fever, and tachycardia, then systemic inflammation occurs [7].

Primary cholelithiasis refers to stones that form directly inside the gallbladder while secondary cholelithiasis refers to stones that originate from the gallbladder accompanied by cholecystitis [7].

In cholelithiasis patients, the main symptom is biliary pain, which is usually persistent, and occurs when the gallbladder duct is blocked by a stone. It usually occurs in the upper right quadrant, but it can also occur in the epigastric, retrograde region, or upper left quadrant. This pain occurs up to the shoulder [7].

If gallstones are left untreated, they can cause pain and even death. If the gallbladder ruptures, the disease is fatal and life-threatening. Therefore, cholecystectomy is the main procedure that must be treated immediately [8].

The use of general anesthesia and controlled ventilation is considered the most acceptable technique for abdominal surgery due to the many effects of pneumoperitoneum. Laparoscopic cholecystectomy is recommended using general anesthesia endotracheal tube [9].

Based on previous research, open cholecystectomy and laparoscopy are performed under general anesthesia. General anesthesia is usually chosen because it is comfortable. In open cholecystectomy, general anesthesia provides sufficient muscle relaxation compared to regional anesthesia which has one of the problems with open cholecystectomy which is limited relaxation of the abdominal muscles, making surgery difficult [9].

The pre-anesthesia phase aims to prepare the patient physically and psychologically before the surgical procedure. In these cases, the patient experiences chronic abdominal pain that has the potential to affect hemodynamic stability during anesthesia. Administration of preremediation with ondansetron and atropine is effective in reducing the risk of nausea and controlling secretions. Preremediation of ondansetron 4 mg to reduce post-anesthetic nausea and atropine sulfate 0.25 mg to prevent bradycardia [10].

Administration of fentanyl 25 mcg analgetic to treat preoperative pain showed a reduction in the pain scale from 6 to 5. Based on previous research, it is said that the dose of fentanyl is 50 to 100 mcg IV/IM [11].

Intra-anesthesia, the selection of the right anesthetic agent is very important. In these cases, a combination of fentanyl, propofol, and rocuronium is used for induction. Previous research has found that induction of anesthesia with propofol, fentanyl, rocuronium, and sevoflurane during the intubation process does not cause hemodynamic disturbances and the surgery is performed smoothly [12]. Fentanyl 2 mcg/kgBB is given as an inducer. Anesthesia was induced with propofol 2 mg/kg body weight, and after ascertaining the loss of the eyelash reflex, rocuronium 0.6 mg/kg body weight was administered [13].

The discovery of limb muscle movements and coughing during anesthesia shows anesthesia awareness. Although the patient experiences stable hemodynamics at the beginning of anesthesia, an increase in the concentration of sevoflurane to 3% is necessary to achieve an adequate depth of anesthesia. Patients were added to the concentration of sevoflurane from 1.5% to 3% to overcome not falling asleep, still able to move, less relaxed, and hypnotic, based on previous studies anesthesia was given using sevoflurane concentrations for adults the MAC value ranged from 1.4% to 2.6% depending on age, for pediatric patients the MAC value ranged from 2.8% to 3.3% depending on age [14].Hemodynamic changes, such as a decrease in blood pressure and pulse after sevoflurane dose adjustment, indicate the patient's response to anesthesia therapy.

After anesthesia, the recovery phase is very important to ensure patient safety and comfort. In this study shivering, which can be caused by hypothermia due to the use of anesthetic agents. Treatment of shivering with a warm blanket and tramadol to reduce patient discomfort is the right step. Providing an electric blanket can overcome hypothermia problems [15]. In this case, the patient was given a blanket and tramadol 50 mg to treat shivering, based on previous research the administration of thick blankets and warm blankets was effective in the treatment of shivering [16]. According to previous studies, using a dose of 0.25 mg/kg BB is effective for mild to moderate shivering [17].

Postoperative pain management with fentanyl, ibuprofen, and vitamin C aims to control pain and facilitate recovery. The highest level of patient satisfaction is the fentanyl group. Patient satisfaction is influenced by pain, comfort and side effects that occur when administering medication. Compared to the morphine or tramadol

groups, fentanyl use is most effective in pain management and is characterized by lower NRS scores at rest or movement, as well as minimal side effects [18].

Ibuprofen is commonly used to treat postoperative pain and as an antipyretic. A study has been published on the efficacy and safety of ibuprofen in the treatment of postoperative pain. Based on the results of the study, the recommended intravenous dose of ibuprofen as an analgesic is 400 to 800 mg every 6 hours, with a maximum daily dose of 3200 mg [19].

The Aldrete Score assessment shows that the patient has achieved adequate recovery criteria before being transferred to the inpatient room. A score of 9 indicates hemodynamic stability and the patient's ability to breathe independently, which is a success in the overall management of anesthesia [20].

Gallstone infections and complications, if untreated, can lead to severe outcomes like gallbladder rupture. Cholecystectomy is the main treatment, typically performed under general anesthesia with controlled ventilation. Proper pre-anesthesia medication, such as ondansetron and atropine, helps manage nausea and secretions. Fentanyl, propofol, and rocuronium were used for anesthesia induction, and an increase in sevoflurane concentration helped ensure adequate anesthesia depth. Post-anesthesia shivering was managed with tramadol and a warm blanket. Pain management with fentanyl, ibuprofen, and vitamin C facilitated recovery. The Aldrete score of 9 indicated successful anesthesia management.

4 Conclusion

This case report discusses a 33-year-old woman with cholelithiasis who experienced pain in the upper right abdomen, missing arising, and nausea. The diagnosis was established through physical, laboratory, and ultrasound examinations, which showed cholelithiasis with the largest stone size of 9.1 mm and accompanied by cholecystitis. The patient underwent cholecystectomy with general anesthesia and endotracheal tube intubation. In the procedure, the patient is induced with fentanyl, propofol, and rocuronium, and then intubation is performed with a 6.5 size endotracheal tube. During surgery, the patient was given a tube with sevoflurane 2% MAC and control ventilation. Postoperatively, the patient was transferred to the recovery room with stable hemodynamic and respiration conditions. General anesthesia and endotracheal tube intubation are effective in supporting the course of the cholecystectomy procedure, ensuring optimal surgical access and reducing discomfort. Postoperative recovery was uneventful with stable respiratory and hemodynamic status. This case underscores the importance of using general anesthesia and endotracheal intubation in cholecystectomy, offering reliable anesthetic management that supports a smooth surgical process. The findings emphasize the need for careful anesthesia planning to ensure patient safety, comfort, and optimal surgical outcomes, contributing to better clinical practices in similar cases.

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