1. Introduction

Gallstones are a very common problem in the global population. In general, gallstones can be asymptomatic, but 10%-25% of affected people may have specific symptoms, such as bile pain and acute cholecystitis, and 1%-2% of them may experience major complications.\(^1\) The incidence of gallstones in the United States is 10% to 20%. Approximately 600,000 cases of choledocholithiasis in the United States undergo cholecystectomy.\(^2\) The impact of Obstructive Jaundice varies greatly, affecting the gallbladder, liver cells, and liver function, and can even cause systemic complications. In obstructive jaundice, Bile drainage, surgery, and endoscopic intervention are potential treatment options, depending on the patient's condition.\(^3\)

The WHO defines surgery as "an essential component of healthcare worldwide, and often the only treatment option that can alleviate disability and reduce the risk of death from the condition".\(^4\) Postoperative complications are also one of the health problems that cause about 3-12 million deaths yearly. Care of postoperative patients in the Intensive Care Unit is one of the efforts to reduce the risk of perioperative mortality.\(^5\)

Gallstones affect almost 20% of the general population worldwide. The prevalence of gallbladder lithiasis in the United States is approximately 20.5 million (6.3 million men and 14.2 million women). At the same time, in Europe, it is reported to vary between 5.9% and 21.9% of the overall population.\(^6\) Critical care in the intensive care unit may be required...
for surgical patients who require invasive and close hemodynamic monitoring, organ support, and mechanical ventilation.  

### 2. Case Presentation

An 83-year-old female patient complained of yellow in her eyes and skin three weeks before admission. Patients also felt pain in the right upper abdomen for six months before admission. Patients with a history of having undergone nephrectomy surgery one year ago and a history of hypertension and diabetes.

Physical examination found the condition of moderate illness, GCS 15, blood pressure 144/97, pulse 86 x per minute, respiratory rate 19x per minute. Sclera icteric at both eyes, the Murphy sign (+) when examination

Laboratory examination revealed increased bilirubin serum, total bilirubin 5.1, direct bilirubin 3.5, and Indirect Bilirubin 1.6. Liver function of this patient also increased where SGOT 35 and SGPT 64. Blood gas analysis obtained PH 7.460, PO$_2$ 67.0, PCO$_2$ 36.0, SO$_2$ 99, HCO$_3$ 25.6, BE 1.8, PaO$_2$/fio$_2$ 373.0, Hb 11.2, hematocrit 32, leucocyte 24.42, thrombocyte 438.000, ureum 45, creatinin 1.1, blood glucose 554.

Abdominal Ultrasound examination showed Obstruction of the bile duct caused by a stone at cystic duct and sludge of the gallbladder. The patient was diagnosed with Jaundice obstruction caused by a stone at the cystic duct with a history of nephrectomy, hypertension, and type 2 diabetes. The patient underwent Laparoscopic cholecystectomy, ERCP, and stent biller.

After the procedure, the patient was admitted to the intensive care unit. The patient was fitted with an endotracheal tube. The patient was intubated for three days. The therapy given to the patient was Ceftriaxon 2x1gr, Tranexamic acid 3x1 g, Vit K 3x10 mg, Ketonolac 3x30mg, and Omeprazole 2x40mg. While in the ICU, close monitoring of the patient's hemodynamics, labor results, and oxygenation ability was carried out.

One day after surgery, blood results have shown Hb 11, HT 30, leucocyte 16.900, platelet 513.000, ureum 21 creatinin 0.6, bilirubin direct 11, bilirubin indirect 3.6, SGOT, and SGPT value was elevated 211 and 212 IU/L. Blood gas analysis has shown Ph 7.32 PCO$_2$ 140, PaO$_2$ 140, HCO$_3$- 23.7. The blood lab became normal after three days. On the third day, the patient had reached minimal ventilator weaning and was extubated. The patient was observed one day after extubation in Intensive care. After being confirmed stable, the patient was transferred to the ward.

### 3. Discussion

This case discussed an 83-year-old female patient who complained of yellow coloration of her eyes and skin three weeks before admission. The most common symptom of cholecodolithiasis is biliary pain, which is usually continuous and occurs when there is an obstruction in the bile ducts. The pain is felt in the right upper quadrant but can occur in the epigastrium, left upper quadrant, and retrosternal area. If the bile pain lasts for more than 12 hours, acute cholecystitis is likely.

Understanding the patient's comprehensive medical and surgical history is fundamental in understanding the postoperative patient in the intensive care unit. Adequate resuscitation is necessary for good clinical perfusion and physiological stability of the patient. An appropriate maintenance fluid rate will sufficiently cover intravascular fluid loss. Resuscitation is optimizing microscopic and macroscopic delivery of metabolic substances to avoid gaps between supply and demand.

Obstructive jaundice also affects vascular tone and dysfunction of vascular tone, so that it will also cause a hypotensive effect, and this is also due to volume depletion. The most common post-ERCP complications are pancreatitis, cholangitis, bleeding, perforation, gallbladder duct infection, and bile leakage.

Obstruction of the bile duct caused by a stone at cystic duct and sludge of the gallbladder was found on ultrasonography. Ultrasound of the liver and gallbladder is necessary to diagnose gallstones and if the bile ducts are dilated. The management to remove
stones in the bile ducts is Endoscopic Retrograde Cholangiopancreatography (ERCP). If required, a bile stent may also be placed. However, since most gallstones accumulate in the gallbladder initially, cholecystectomy is the treatment of choice for patients with recurrent symptomatic gallstones.\textsuperscript{10}

Treatment selection in obstructive jaundice due to gallstones includes Preoperative ERCP with or without endoscopic sphincterotomy (ES), laparoscopic CBDE and stone removal, open bile duct exploration (CBDE), postoperative ERCP with or without endoscopic sphincterotomy. The choice of method that can be used depends on the severity, location of the stones and complications that occur.\textsuperscript{2}

While in intensive care, patients are given antibiotic prophylaxis to reduce the chance of postoperative infection. Intensive monitoring, including vital signs and hemodynamics such as blood pressure, heart rate, pulse oximetry, body temperature, blood sugar level, urine output, drainage measures (quality and quantity), and fluid balance, are also essential.\textsuperscript{5}

Generally, a postoperative patient’s decision to enter the ICU depends on the medical condition and severity of illness, pre-existing comorbidities, and the type of invasive procedure performed. Treatment in the Intensive care unit may be required for surgical patients who require mechanical ventilation or close and invasive post-operative monitoring.\textsuperscript{7,11}

While most patients admitted to the intensive care unit usually require closed cardiorespiratory and metabolic monitoring, mechanical ventilation is still required in most postoperative patients. In addition, patients need more specialized management to monitor patients on the first postoperative day, most often the possibility of complications such as infection.\textsuperscript{12}

The resuscitation strategy used is to optimize cardiovascular performance and adequate oxygen delivery. An increase in serum lactate concentration and a decrease in either central or mixed venous oxygen saturation is a marker of inadequate oxygen delivery. However, typical mixed and central venous oxygen saturation values do not necessarily guarantee average tissue oxygen utilization. In hemodynamic assessment, the pulse rate and pressure waveforms (variations of stroke volume and cardiac output) can be analyzed to predict the patient’s volume responsibility.\textsuperscript{13}

The type of fluid resuscitation product, maintenance rate, and bolus volume should be individualized to the patient’s clinical condition. Optimal fluid resuscitation can minimize the inflammatory response. In fluid resuscitation, it is not recommended to resuscitate using hypotonic or hypertonic fluids. Hypotonic fluids are unsuitable for volume resuscitation because hypotonic fluids cannot remain in the extracellular space. In contrast, hypertonic fluids will cause more significant intravascular expansion than isotonic fluids. Hypertonic fluids do not give better results than crystalloids; similarly, isotonic crystalloids are at least as efficacious or better than colloids to achieve the same endpoint.\textsuperscript{13}

When the patient is clinically ready to begin weaning from the ventilator, the patient must also have adequate physiologic reserve before extubation. Resuscitation should be complete, and vasoactive support should no longer be required; hemostasis should be achieved, no problems with oxygen exchange, and the ability to protect the airway should be present. The patient should be awake and reasonably cooperative. \textsuperscript{13} Assessment of clinical readiness is done daily, considering weaning the patient from mechanical ventilation. The patient is comfortable, the patient’s hemodynamics are stable, there is no tachypnea and respiratory muscle problems, and there is no short-term plan for further surgery.

4. Conclusion

Understanding the patient’s comprehensive medical and surgical history is fundamental in understanding the postoperative patient in the intensive care unit. Adequate resuscitation is necessary for good clinical perfusion and physiological stability of the patient.
5. References