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**Evaluation of recurrent esophageal variceal rupture post-endoscopic band ligation:
A case report**

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Abstract

Background: One serious side effect of portal hypertension that is often seen in individuals with liver cirrhosis is esophageal varices. Even after Endoscopic Band Ligation (EBL), there is a significant chance that these varices may bleed again. Uncontrolled portal pressure, therapeutic noncompliance, and concomitant gastrointestinal disorders are often linked to rebleeding.

Purpose: To evaluate the risk factors influencing the success of Endoscopic Band Ligation (EBL) in preventing rebleeding in patients with a history of esophageal variceal rupture.

Method: Using a descriptive case study approach with an eye on one patient undergoing treatment at a hospital, this research medical records provided data, which were then descriptively examined to assess clinical factors, forms of treatment given, and patient condition over time.

Results: Results revealed that individuals with hepatic cirrhosis brought on by a hepatitis B infection are very likely to rebleed. Among the contributing causes were uncontrolled portal hypertension, congestive gastropathy, gastrointestinal bleeding-related chronic anemia, and inadequate therapeutic adherence. Furthermore important were eating behaviors that aggravate gastrointestinal problems.

Conclusion: Stopping rebleeding calls for a multidisciplinary strategy. Monitoring portal pressure, following beta-blocker and antiviral treatment, and teaching patients about long-term care are among these aspects. To confirm these results, further research using bigger sample sizes is required.

Keywords: Endoscopic Band Ligation; Esophageal Variceal Bleeding; Liver Cirrhosis; Portal Hypertension.

INTRODUCTION

Esophageal varices are a significant complication of portal hypertension commonly found in patients with chronic liver disease, particularly liver cirrhosis. Portal hypertension leads to the dilation of esophageal veins, which may rupture and cause life-threatening gastrointestinal bleeding (Sarma & Seetharaman, 2021; Smith, Friedman, Murchison, Tanner, Smith, & Dollar, 2020). One of the primary management methods is Endoscopic Band Ligation (EBL), which effectively reduces the recurrence of bleeding and mortality rates (Abdo, Moustafa, Mostafa, Abdelbary, Elatar, Rahim, & Abdelhalim,

2022; Misra, Agrawal, & Misra, 2021). However, some patients still experience variceal rupture despite undergoing the EBL procedure, indicating the presence of risk factors that influence the success of the therapy. Identifying these factors is crucial to optimizing patient management strategies and preventing complications (Chi, Lian, & Zhuang, 2024; Pallio, Melita, Shahini, Vitello, Sinagra, Lattanzi, & Maida 2023).

Globally, chronic liver disease caused by hepatitis B and C infections is the leading cause of cirrhosis and portal hypertension. The Global Burden

of Disease study estimated approximately 686,000 deaths due to hepatitis B in 2013, with a mortality rate of 5.9 per 100,000 population (Nelson, Easterbrook, & McMahon, 2016). In Indonesia, according to the 2013 Basic Health Research, the prevalence of hepatitis B reached 7.1% (approximately 18 million people), while hepatitis C affected around 1.01% (about 2.5 million people) (Muljono, 2017; Scrutton, Wallace, & Wait, 2018). Cirrhosis due to viral hepatitis is the primary cause of esophageal varices, with a primary bleeding rate of up to 30% within one year of the initial diagnosis (Li, Cheng, Li, Wang, & Yan, 2013; Mohammed, Abdo, & Mudawi, 2016). Additionally, patients who experience variceal bleeding have a high risk of rebleeding within six weeks of the first episode, with a significant mortality rate (Ibrahim, Kalil, & Habeeb, 2021).

Although Endoscopic Band Ligation is a highly effective therapy in reducing the risk of recurrent bleeding, some patients still experience repeated ruptures after undergoing this procedure (Hassan, Mahamed, Abdelmalek, & Mostaf, 2023). Factors contributing to treatment failure include persistently high portal pressure, advanced liver insufficiency, coagulation disorders, large varices, and the ineffectiveness of adjuvant pharmacological therapy such as non-selective beta-blockers (Gralnek, Camus Duboc, Garcia-Pagan, Fuccio, Karstensen, Hucl, & Triantafyllou 2022; Nagesh, Pulipaka, Bhujju, Martinez, Badam, Nageswaran, & Mansour, 2025). Inadequate monitoring and less-than-ideal lifestyle changes may also raise the risk of problems (Laleman, Vanderschueren, Mehdi, Wiest, Cardenas, & Trebicka, 2024). Therefore, it is crucial to examine the variables affecting how well EBL prevents recurrent bleeding in order to provide more accurate patient care.

One possible remedy is a thorough evaluation of individuals with recurrent variceal rupture after EBL. This includes monitoring portal pressure, regularly assessing liver function, and using additional pharmacological therapies to lower portal pressure (Blasi, Machlab, Risco, Costa-Freixas, Hernández-Cely, Horta, & Cardenas, 2021). Moreover, secondary prevention strategies, such as combining EBL with beta-blocker therapy, need further evaluation to assess their effectiveness in reducing recurrence rates (Yo & Nursyirwan, 2024). A

multidisciplinary approach involving hepatologists, gastroenterologists, and transplant surgeons is crucial in managing complex cases (Oh & Sinn, 2024).

The theoretical foundation of this study is based on the pathophysiology of portal hypertension, which leads to the formation and rupture of esophageal varices. High portal pressure increases stress on variceal walls, and rupture and bleeding occur when they exceed a certain threshold (Padraic, 1992). The body's compensatory mechanism through splanchnic vasodilation also contributes to disease progression. Another supporting theory is the effectiveness of EBL in reducing the risk of bleeding through the mechanism of variceal strangulation, leading to thrombosis and gradual obliteration of varices (Seo, 2018). However, if portal pressure remains high or additional risk factors are present, re-canalization may occur, resulting in treatment failure and recurrent bleeding (Helal, Vakharia, Brinjikji, Carlson, Driscoll, Van Gompel, & Cloft 2022; Larrue, Allaire, Weil-Verhoeven, Barge, Thabut, Payance, & Guiu 2024).

This study supports on the efficacy of Endoscopic Band Ligation (EBL) as the primary technique for controlling esophageal varices. Both trials show how well EBL stops recurrent bleeding and contrast its effectiveness with other methods of variceal hemorrhage management (Deng, Jiang, Chen, Mou, Tuo, Shi, & Jiang, 2024). Furthermore, which addresses post-EBL complications—especially bleeding resulting from post-banding ulcers—this research is consistent. Both research look at ways to control problems to enhance therapeutic results (Elbahr, Kamal, Alsebaey, Amin, Abbasy, Edris, & Gad-Allah, naser, 2021). In addition, in line with other studies investigating risk factors for recurrent bleeding after EVL. Important factors affecting the effectiveness of esophageal variceal treatment are hemoglobin level, MELD score, and number of ligations (Giri, Sundaram, Jearth, & Bhrugumalla, 2022).

In contrast to studies that emphasize the comparison of EBL and endoscopic tissue adhesive injection (TAI) for controlling gastric varices (Deng et al., 2024), this study assessed patients with a history of recurrent rupture after receiving EBL. Although there are studies investigating self-expanding metal stents (SEMS) as a replacement therapy for post-

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ligating ulcer bleeding, this paper focuses more on patient risk factors and long-term home care elements to stop recurrent bleeding (Elbahr et al., 2021). Furthermore, in studies that mainly examine meta-analyses of early bleeding risk variables after EVL. This study, on the other hand, looks explicitly at situations where recurrent bleeding after EBL has a history and how long-term care affects patient prognosis (Giri et al., 2022).

Focusing on risk factors, familial influences, lifestyle choices, and how continuing treatment might lower recurrent bleeding rates, this research intends to analyze individuals with a history of recurrent esophageal variceal rupture following EBL. This research is unusual in its thorough strategy of assessing individuals with a history of recurrent esophageal variceal rupture after Endoscopic Band Ligation (EBL). This study aims to evaluate patients with a history of recurrent esophageal variceal rupture after EBL, focusing on risk factors, family influences, lifestyle habits, and how continuous care can reduce recurrent bleeding rates. Unlike other research mainly stressing the efficacy of treatments or general risk factor assessments, this study offers fresh insights into comprehensive techniques for post-EBL patient care to lower morbidity and death rates owing to recurrent esophageal variceal bleeding.

RESEARCH METHOD

To assess the treatment of a patient with a primary diagnosis of hematemesis melena because of probable ruptured esophageal varices, stomach ulcer, congestive gastropathy, microcytic hypochromic anemia, and thrombocytopenia, this study used a descriptive research design using a case study methodology. Type 2 diabetes mellitus and liver cirrhosis associated with hepatitis B were among the subsequent diagnoses. The research was conducted on November 24, 2022, at Wijaya Kusuma Hospital. The medical records of individuals who received care and assessment at the hospital provided the data—patients with comparable illnesses who were admitted throughout the designated time frame made up the study population. A patient with medical record number 520046, initials DK, who had been diagnosed with diseases related to the study's focus, served as the study's sample. Purposive sampling, which chose a

patient with certain traits in line with the study's goals, was the sampling strategy used.

Patient medical records, physical examination findings, laboratory test results, and past diagnostic and treatment performance helped gather data. Documentation included anamnesis, physical examination, supporting studies, diagnosis, treatment plans, medical procedures, assessments, and patient education. The dependent variable was the patient's clinical condition improvement after the recommended treatment throughout the hospital stay. The independent variables, meanwhile, included the forms of therapy given—that is, pharmaceutical treatment and medical procedures. Changes in clinical indicators, including hemoglobin levels, vital signs, transfusion response, laboratory test results, and patient condition general progress during therapy, defined the variables.

Standard medical tools for patient exams, including vital sign measuring devices, laboratory diagnostic tools, and medical imaging equipment, including ultrasonic waves, were among the instruments utilized in this investigation. The materials employed were immunological data, clinical chemistry, full blood test results, and other diagnostic imaging findings. Source triangulation—combing through data from anamnesis, physical examinations, laboratory, and supporting test results—ensured the accuracy of the information. Consultations with internal medicine specialists also ensured the correctness and therapeutic interpretation of the diagnosis. Under medical ethical standards, this research got authorization from the hospital to view the patient's medical information while upholding patient anonymity. Every piece of data collected was only for scientific use; none would be used outside of this project.

RESEARCH RESULTS

Anamnesis

Chief Complaint: Black stools and vomiting blood. History of Present Illness: The patient had been having black stools for about a week before being admitted to the hospital. The black stools have been persistent and have never returned to a normal color during this period, regardless of food intake. The stool consistency is soft and mushy, resembling shrimp paste, with a distinctive odor. The patient has one episode of black stools per day. The complaint is

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also accompanied by nausea for one week and vomiting of dark red blood for the past four days, occurring twice daily. Today, the patient has not vomited but still feels nauseated. Additionally, the patient has been experiencing pain in the epigastric region and upper right abdomen for the past month. The pain is stabbing in nature, intermittent, with an intensity of around 3 on the pain scale. The pain worsens when the patient skips meals or consumes spicy foods and improves after taking sucralfate syrup. The patient denies experiencing burning sensations in the chest or throat, as well as a bitter taste in the mouth. The patient has had a fluctuating fever, without a specific pattern of temperature changes. Cold sweats are denied. The patient also denies experiencing joint pain, headaches, or

rashes. There is no history of gum bleeding or nosebleeds.

History of Medication: Tenofovir 1x300mg, Glimepiride 1x4mg, Lansoprazole: 1x30mg, Curcuma 1x1 tab, Sucralfate syrup 1x15ml, Propranolol 2x10mg.

Past Medical History: In January 2021, the patient experienced hematemesis and melena accompanied by general weakness due to anemia, with a hemoglobin level of 3 g/dL. An abdominal ultrasound revealed cirrhosis of the liver, ascites, mild splenomegaly, gastritis, right pleural effusion, and cholelithiasis measuring 21.5 mm without signs of inflammation. The patient also tested positive for HBsAg and underwent a transfusion of six units of packed red cells (PRC).

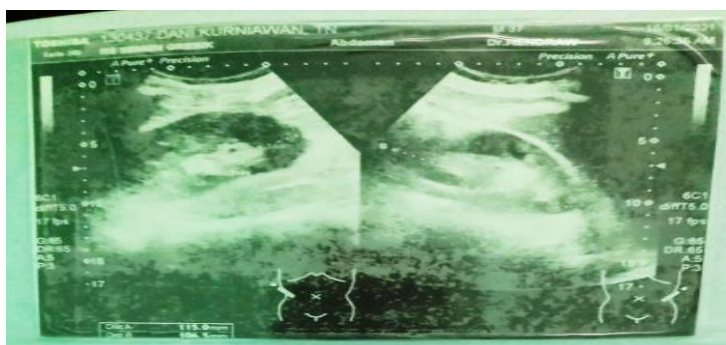


Figure 1. Abdominal ultrasound findings showing liver cirrhosis

In September 2021, the patient had another episode of hematemesis and melena and underwent an endoscopy, which revealed grade I/II esophageal varices with a positive red color sign (RCS), congestive gastropathy, and gastric ulcers.

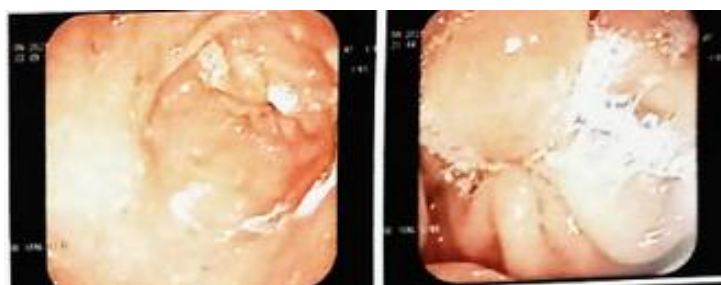


Figure 2. Grade I/II esophageal varices, RCS (+), congestive gastropathy, gastric ulcers.

Follow-up endoscopy in December 2021 showed progression of the esophageal varices to grade III with a negative RCS, along with congestive gastropathy and gastric ulcers.

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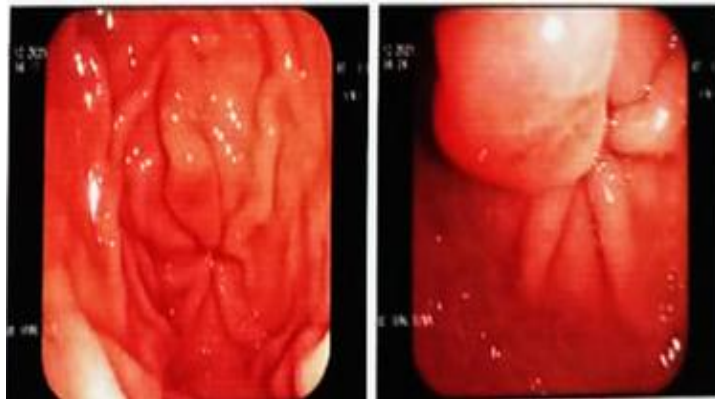


Figure 3. Grade III esophageal varices, RCS (-), congestive gastropathy, gastric ulcer.

In March 2022, follow-up endoscopy showed grade II esophageal varices with a positive RCS, congestive gastropathy, and gastric ulcers, leading to the performance of Endoscopic Variceal Ligation (EVL) six times.

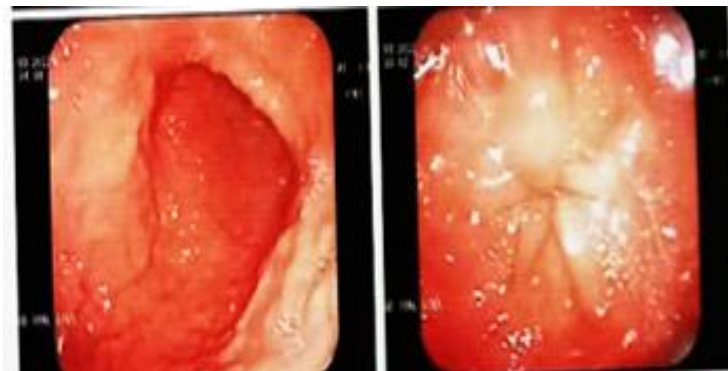


Figure 4. Grade II esophageal varices, RCS (+), congestive gastropathy, gastric ulcers, EVL

In May 2022, follow-up endoscopy again showed grade I/II esophageal varices with a positive RCS, congestive gastropathy, and gastric ulcers.

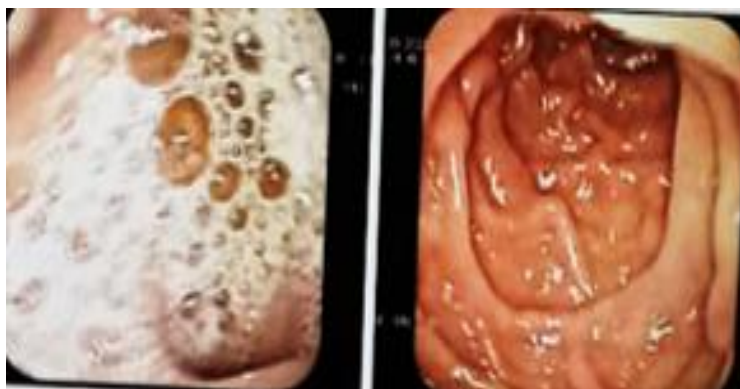


Figure 5. Grade I/II esophageal varices, RCS (+), congestive gastropathy, gastric ulcers

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In June 2022, the follow-up endoscopy revealed grade II esophageal varices with congestive gastropathy, necessitating another round of EVL six times. By September 2022, endoscopic evaluation showed grade I/II esophageal varices with a negative RCS, and the patient was advised to return for follow-up in three months for further evaluation. Additionally, the patient was diagnosed with Diabetes Mellitus in early 2022. Initially, the patient was prescribed Lantus insulin at 16 units, which was gradually tapered down to 14, 10, 8, and finally 6 units as blood glucose levels improved each month. Currently, the patient is only taking an oral antidiabetic drug (OAD), namely glimepiride 4 mg.

Family and Social History: The patient has a family history of hepatitis B, as the mother was infected before pregnancy and childbirth; however, details regarding the mother's treatment are unknown. Socially, the patient does not consume alcohol or smoke. However, the patient frequently consumes spicy foods.

Physical Examination

The patient is generally weak, with compos mentis consciousness and a Glasgow Coma Scale (GCS) score of 4-5-6. Vital signs indicate a blood pressure of 100/59 mmHg, pulse rate of 82 beats per minute, respiratory rate of 20 breaths per minute, body temperature of 36.6°C, and oxygen saturation (SpO₂) of 97% on room air. Examining the head and neck, the hair seems normal. The ears, nose, mouth, throat, and neck are within normal limits without lymph node enlargement; the eyes reveal anemia +/- and jaundice +/- . The chest wall seems symmetrical without retractions; cardiac examination finds no gallops or murmurs. Normal vesicular breath sounds (+/+) without wheezing or crackles appear on a pulmonary exam. An abdominal examination shows good organ supply and no distension. The patient reports the right hypochondria and epigastric areas are painful. The spleen is Schaffner grade 1-2; the liver is non-palpable; bowel sounds are evident (BU +). Whereas the lower extremities show no pitting edema, the upper extremities show excellent capillary refill (AHKM) with a capillary refill time (CRT) of two seconds. The genital examination is within normal limits (tde), and neurological examination reveals no significant abnormalities (tde).

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Supporting Examinations

A complete blood count (CBC) shows hemoglobin levels at 6.23 g/dL, below normal and indicative of anemia. Leukocyte count is 4.57 thousand/ μ L, within the normal range, while the erythrocyte sedimentation rate (ESR) is elevated at 50 mm/hour, possibly indicating inflammation or infection. Differential counts include eosinophils at 3%, basophils at 1%, band neutrophils at 0%, segmented neutrophils at 62%, lymphocytes at 25%, and monocytes at 9%. Hematocrit is recorded at 19%, which is also low and aligns with the decreased hemoglobin levels. Platelet count is 118 thousand/ μ L, which is relatively low. Red blood cell parameters indicate erythrocytes at 2.62 million/ μ L, with mean corpuscular volume (MCV) at 73 fL, mean corpuscular hemoglobin (MCH) at 24 pg, and mean corpuscular hemoglobin concentration (MCHC) at 33 g/dL.

Biochemical test results show aspartate aminotransferase (AST/SGOT) at 45.7 U/L and alanine aminotransferase (ALT/SGPT) at 37.4 U/L, which are within acceptable limits but require further observation. Blood urea nitrogen (BUN) is 12.7 mg/dL, and creatinine is 0.79 mg/dL, indicating normal kidney function. Uric acid is 5.6 mg/dL, phosphorus at 3.6 mg/dL, sodium at 139 mmol/L, potassium at 3.9 mmol/L, and chloride at 109 mmol/L. Calcium levels are recorded at 7.8 mg/dL, slightly below normal and may require further evaluation. In immunological tests, SARS-CoV-2 antigen is negative, while anti-HCV and anti-HIV tests are non-reactive, indicating no evidence of hepatitis C or HIV infection. However, the hepatitis B surface antigen (HBsAg) is reactive, with an index of 6145.49, suggesting active hepatitis B infection or a carrier state that requires further evaluation to determine the infection stage.

Diagnosis

The patient is diagnosed with hematemesis melena, suspected to be caused by ruptured esophageal varices, gastric ulcers, and congestive gastropathy, contributing to microcytic hypochromic anemia and thrombocytopenia. Additionally, the patient has liver cirrhosis due to hepatitis B and type 2 diabetes mellitus as a comorbid condition that may worsen the clinical condition.

Planning

Additional tests, including HDT, serum ferritin, total iron-binding capacity (TIBC), coagulation profile, INR, serum albumin, bilirubin, DL, SE, renal function tests (RFT), and calcium and phosphorus levels post-transfusion, are required because the patient has been diagnosed with HBeAg-positive hepatitis B and has detectable HBV DNA. Monitoring calls for further assessment by abdominal ultrasonography, either with or without AFP. ABC stabilization and the transfusion of four bags of packed red blood cells (PRC) at a rate of one bag per day are examples of therapeutic procedures. The patient receives intravenous metoclopramide, lansoprazole (30 mg twice day IV), and an aminofusion hepar infusion (500 mL over 24 hours). An Ocreotide bolus of 50 mcg IV/SC and an Ocreotide drip at 25 mcg/hour (six ampules in 500 cc of 0.9% NaCl over 24 hours) are examples of further treatment. Cefotaxime 2 g is used three times a day as part of antibiotic treatment, along with 10 mg of vitamin K twice a day. Tenofovir (300 mg once day), Curcuma (20 mg three times daily), Propranolol (40 mg twice daily), Calcium carbonate (500 mg three times daily), Glimepiride (4 mg once daily), Vitamin D3 (1000 IU once daily), and Lactulose syrup (15 cc three times daily) are examples of oral drugs. Medical therapies include the nasogastric tube (NGT), gastrointestinal lavage if a positive output is discovered, and communication with an internal medicine specialist to go over ligation or sclerotherapy. The patient is housed at the Wijaya Kusuma ward for further viewing. The review method includes recording the patient's response to transfusion, monitoring NGT output, assessing clinical development or deterioration, noting new complaints, and regularly vital signs. Serial SE, DL, and liver function tests (LFT) are performed to assess liver health and response to treatment.

Education

The patient should only eat meals that the hospital gives to prevent eating that can aggravate their situation. Hot and acidic foods should be avoided if one wants to exacerbate the illness. Therapy cannot be effective without the patient always taking all advised medications at the appropriate dosage. To prevent further complications, the patient should also avoid medicines and substances that can compromise liver function.

Findings

Hematemesis, melena, and overall weakness were the patient's concerns when they first arrived. Hypochromic microcytic anemia was found by a complete blood count, most likely as a result of upper gastrointestinal hemorrhage. Esophageal varices, stomach ulcers, and congestive gastropathy linked to portal hypertension as a result of severe liver cirrhosis are among the patient's medical history. Most definitely, the cause of the severe bleeding was the burst esophageal varices, which carry a great danger of rebleeding. The patient was seen to have been consuming less propranolol than advised, thereby increasing her risk of additional bleeding. Propranolol administered appropriately during esophageal variceal ligation may lower the risk of bleeding recurrence. Since January, the patient has been diagnosed with hepatitis B virus-induced liver cirrhosis. According to the patient's family history, the illness was most likely vertically transmitted from her mother. Due to the immunological tolerance phase, this infection is often asymptomatic in infancy and only becomes symptomatic in adulthood after severe liver damage. In order to treat anemia, the patient, who had been in the hospital since November 26, underwent a packed red cell (PRC) transfusion. Pharmacological treatment includes octreotide to control portal hypertension and stop more bleeding, metoclopramide as an antiemetic, and lansoprazole to relieve the discomfort from stomach ulcers. Tenofovir was used to treat hepatitis B, while curcuma was administered as a hepatoprotective supplement. Blood testing and anti-HCV screening were among the other tests conducted to keep an eye on the patient's health.

Hematemesis stopped and melena subsided on November 27, but the patient continued to feel weak all over. Leukocyte and platelet counts decreased as hemoglobin levels steadily rose. Additionally, hypoalbuminemia was found. Since there was no further bleeding, octreotide treatment was stopped on November 28. Lactulose was created to aid in the removal of surplus ammonia brought on by advanced cirrhosis. Hemoglobin levels rose and the patient had no symptoms on November 29, but the platelet count kept dropping. There was a modest rise in albumin levels. Following ongoing treatment with tenofovir, glimepiride, lansoprazole, curcuma,

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sucralfate, and propranolol, the patient was released on November 30. In order to reduce the danger of recurrent bleeding and the advancement of cirrhosis, the patient received education about medication adherence. In December, an esophageal variceal ligation and endoscopic examination were planned. The patient also has a history of type 2 diabetes mellitus, which is most likely related to hepatogenous diabetes, or liver cirrhosis. It is thought that hepatic cirrhosis-induced insulin resistance in peripheral tissues is the etiology of this illness. Because biguanides like metformin might cause lactic acidosis, their use is not as advised. Alpha-glucosidase inhibitors, on the other hand, may lower postprandial blood glucose levels in individuals suffering from this illness. The patient overall had severe liver cirrhosis brought on by a hepatitis B infection, which caused gastrointestinal bleeding from ruptured esophageal varices. The management included planned endoscopic operations, pharmacological therapy, and supportive care. Patient education on medication adherence is crucial if the goal is to prevent further issues.

DISCUSSION

Due to extensive liver cirrhosis brought on by a hepatitis B infection, patients who have had repeated esophageal variceal rupture after Endoscopic Band Ligation (EBL) are at a heightened risk of bleeding again. The risk of rebleeding is significantly increased by portal hypertension, the main consequence of liver cirrhosis, according to prior research, particularly in patients with untreated esophageal varices (Diaz-Soto & Garcia-Tsao, 2022; Lesmana, Raharjo, & Gani, 2020). Other significant risk factors include congestive gastropathy and inadequate dosages of propranolol, in addition to portal hypertension. The correct dose of beta-blockers is essential to reduce portal pressure and avoid variceal rupture, according to previous studies. The patient's family history highlights the role of genetic and environmental variables in the development of liver cirrhosis by suggesting the potential for vertical transmission of hepatitis B from the mother (de Franchis, 2020). Based on other literature, cirrhosis and hepatocellular carcinoma in Asian populations are mostly caused by vertical transmission of hepatitis B. This highlights the need for early screening and antiviral treatment (Nguyen,

Wong, Gane, Kao, & Dusheiko, 2020). In terms of lifestyle choices, the patient has never smoked or used alcohol, two behaviors that slow the advancement of liver disease. However, consuming spicy foods often might develop congestive gastropathy, aggravate gastric ulcers, and irritate the stomach. This is in line with a research by Ried et al. that showed that in individuals with chronic liver disease, eating foods that upset the stomach may raise the risk of gastrointestinal bleeding. Therefore, patients are recommended to avoid meals that may exacerbate gastrointestinal disorders, such as spicy and acidic foods and carbonated and caffeinated drinks, in order to prevent rebleeding (Ried, Travica, Dorairaj, & Sali, 2020).

In order to lower the danger of rebleeding, long-term care is essential. To manage portal hypertension and reduce the risk of future esophageal variceal rupture, pharmacological treatment must be followed, especially when it comes to the right dose of propranolol. According to a number of studies, the recurrence rate of variceal hemorrhage is considerably decreased when beta-blocker medication is used (Baye, Abay, Tesfaye, Ahmed, Arage, Zewude, & Anley, 2023; Jachs & Reiberger, 2021). Additionally, as advised by the European Association for the Study of the Liver, patients must continuously receive antiviral medication with tenofovir to inhibit the reproduction of the hepatitis B virus and stop the advancement of liver cirrhosis (Ghany, Buti, Lampertico, & Lee, 2023). Liver function may also be supported by hepatoprotective substances like curcuma. Previous studies have shown the anti-inflammatory and antifibrotic properties of ginger in individuals with chronic liver disease (An, Jang, & Lee, 2020). To assess the effectiveness of treatment and find early indicators of recurrent esophageal varices, routine monitoring using endoscopy and laboratory testing is required. Routine hemoglobin, platelet count, albumin levels, and liver function assessments should be conducted to evaluate the patient's condition and prevent further complications. A study by Franchis et al. emphasized that periodic monitoring with transient elastography and endoscopy contributes to early detecting high-risk esophageal varices (de Franchis, 2008). The patient should also maintain strict blood sugar control due to comorbid type 2 diabetes mellitus, which can worsen

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liver conditions through insulin resistance mechanisms known as hepatogenous diabetes. A study by Cetin et al. found that patients with liver cirrhosis and diabetes have a faster rate of fibrosis progression compared to those without insulin resistance (Cetin, Demir, & Sen, 2020). Beyond medical treatment and monitoring, patient and family education is essential for continuous care. Patients need to be educated about the importance of a healthy diet, limiting activities that may increase portal vein pressure, and recognizing warning signs of rebleeding that require immediate medical attention. A study that has been conducted emphasizes that community-based education and multidisciplinary interventions improve patient compliance with chronic liver disease management (Sun & Li, 2023). A combination of appropriate medical management, adherence to therapy, and lifestyle modifications can minimise the recurrence rate of variceal bleeding, ultimately improving the patient's long-term quality of life.

Focusing not only on treatment efficacy but also on risk factors, medication adherence, and long-term home care, this study provides benefits over past studies by analyzing patients longitudinally after recurrent esophageal variceal rupture after Endoscopic Band Ligation. This study is more thorough than previous studies that only examined the efficacy of Endoscopic Band Ligation and Endoscopic Tissue Adhesive Injection in treating type 1 gastric varices (Deng et al., 2024). As it includes a long-term assessment of patients with liver cirrhosis resulting from hepatitis B virus infection and the impact of pharmacological therapies such as propranolol and tenofovir in preventing rebleeding. In contrast to studies examining the use of Self-Expandable Metal Stents to control post-ligation ulcer bleeding, this study has a more general scope by not only focusing on complications after Endoscopic Band Ligation but also assessing long-term preventive strategies against the risk of recurrent bleeding (Elbahr et al., 2021). Early predictors of bleeding following Endoscopic Band Ligation, offered only statistical analysis without investigating long-term clinical management or the impact of risk factors including therapy adherence, home care, and family history, which are the primary focus of this research. The results of this study generally match other studies by verifying that portal

hypertension, inadequate propranolol dosage, and risk factors like congestive gastropathy lead to a higher risk of rebleeding. This research does, however, provide value by stressing the need of medication adherence, comorbidities control—such as type 2 diabetes and patient education in lowering the recurrent risk of esophageal variceal hemorrhage (Giri et al., 2022).

The findings of this study provide significant contributions to the field of nursing and health sciences, particularly in the management of patients with liver cirrhosis and complications such as esophageal varices. Nurses are crucial in monitoring vital signs, early detection of recurrent bleeding symptoms, and educating patients and their families about adherence to treatment, diet, and a healthy lifestyle. Nursing care that focuses on continuous clinical monitoring, appropriate administration of therapy, and close observation of side effects from medications such as propranolol and tenofovir is essential to prevent further complications. In addition, nurses must ensure that patients understand the importance of managing diabetes mellitus and avoiding gastrointestinal triggers such as spicy foods, which can exacerbate gastropathy. From a health science perspective, this study reinforces the importance of a multidisciplinary approach and continuous education in improving patient compliance and long-term treatment outcomes. It also encourages the implementation of evidence-based clinical protocols for the comprehensive management of cirrhosis and esophageal varices.

CONCLUSION

Esophageal variceal rebleeding after endoscopic band ligation is caused by uncontrolled portal hypertension, poor medication compliance, and risk factors such as hepatitis B-related liver cirrhosis. Ongoing care and education have been shown to be effective in reducing recurrence. A multidisciplinary approach is needed, and further research is recommended.

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