Nursing Care of a Patient Undergoing Transjugular Intrahepatic Portosystemic Shunt Placement in the Radiology Department

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ABSTRACT: **Esophageal varices occur in a significant proportion of patients who develop portal hypertension secondary to liver cirrhosis. Rupture of these varices can cause significant life-threatening hemorrhage. Several therapeutic options are available for the management of portal hypertension and thus the prevention of variceal bleeding. This article presents a patient case study that discusses the nursing care of a patient undergoing a transjugular intrahepatic portosystemic shunt (TIPS) procedure in a specialized radiology department in the Republic of Ireland. The pathophysiology of esophageal varices is presented. A brief overview of therapeutic management techniques for esophageal varices is then presented followed by an introduction to the TIPS procedure including indications and contraindications. The patient case is then presented, highlighting the selection criteria. (J Radiol Nurs 2016;35:43-50.)**

KEYWORDS: **Esophageal varices; Transjugular intrahepatic portosystemic shunt; TIPS; Nursing care; Radiology.**

INTRODUCTION

Esophageal varices may form in any part of the gastrointestinal tract, but they are most commonly present in the upper portion of the esophagus (LaBrecque, Khan, Sarin, & Le Mair, 2014). Sudden rupture of these varices can cause life-threatening hemorrhage and is a clinical emergency. This is most often related to portal hypertension caused by liver cirrhosis (Kalva, Salazar, & Walker, 2009). Krajina, Hulek, Fejfar, and Valek (2012) reported that in Europe and North America, portal hypertension accompanies cirrhosis of the liver in more than 90% of cases, and varices are present in 5% to 33% of patients with portal hypertension (LaBrecque et al., 2014). Radiological intervention for the management of esophageal varices involves transjugular intrahepatic portosystemic shunt (TIPS) placement. Scottish Intercollegiate Guidelines Network (SIGN) (2008) recommended that a TIPS procedure should be considered to prevent esophageal variceal rebleeding in patients with contraindications, intolerance to or failure of endoscopic and/or pharmacological therapy, and is generally accepted as a second-line therapy (Krajina et al., 2012). A TIPS procedure involves the placement of a shunt between the portal and

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hepatic veins, which aids in the reduction of portal hypertension and thus reducing the blood flow to the varices (Aspinall & Taylor, 2004).

Pathophysiology of Esophageal Varices

Excessive intake of alcohol leads to the inflammation of the liver cells resulting in fibrosis and scarring of the liver tissue, thus leading to liver cirrhosis. Cirrhosis leads to obstruction of blood flow into the liver via the portal vein. When blood cannot pass into the liver from the portal vein, the pressure in the portal vein rises resulting in increased blood pressure within the portal system leading to portal hypertension (Bare, Cheever, Hinkle, & Smeltzer, 2011). Portal hypertension results in the formation of venous collaterals, which redirect the blood to systemic veins in the esophageal plexus, hemorrhoidal plexus, and retroperitoneal veins, thus bypassing the liver. About 50% of patients with cirrhosis will develop gastroesophageal varices (LaBrecque et al., 2014).

Varices may develop in any part of the gastrointestinal tract but will generally occur in the distal few centimeters of the esophagus in the weakest regions of the vessel wall and bulge outward into the lumen of the esophagus. As they are thin walled and fragile, they are easily eroded or traumatized by swallowed food (Grant & Waugh, 2006). The rupture of these abnormal varicoid vessels can cause life-threatening hemorrhage.

Management of Bleeding Varices

Esophageal varices usually do not cause signs and symptoms unless they bleed. The initial management of bleeding esophageal varices involves maintenance of hemodynamic stability through fluid resuscitation. Fluids and blood transfusion are required to stabilize the patient and maintain vital organ perfusion (Fullwood, 2012). Pharmacological management for bleeding and reoccurrence of bleeding involves medical therapy to lower the portal pressure. This consists of administering pharmacological agents, which act by decreasing the splanchnic blood flow and portal venous inflow (Fullwood, 2012). Endoscopic management of hemorrhage involves endoscopic band ligation and sclerotherapy, which are successful in controlling bleeding in up to 90% of cases (LaBrecque et al., 2014). Another endoscopic treatment option available is that of balloon tamponade, although this is not frequently used. With balloon tamponade, there is a high risk of rebleeding once the balloon has been deflated (LaBrecque et al., 2014), and it is associated with other complications, such as esophageal tear, infection, aspiration, and pneumonia (Hegab & Luketic, 2001; Luketic & Sanyal, 2000).

Transjugular Intrahepatic Portosystemic Shunt

Radiological intervention performs TIPS placement. This involves the placement of a shunt between the portal and hepatic veins, thereby reducing the blood flow to the varices while retaining some blood flow to the liver (Aspinall & Taylor, 2004). TIPS, as a percutaneous alternative to surgical portosystemic shunts for decompression of symptomatic portal hypertension, was conceived, and its technique developed in animal experiments in the late 1960s by Rösch (Krajina et al., 2012). Rösch first studied the idea of introducing a cannula through the parenchyma of the liver to create a fistula between branches of the hepatic and intrahepatic portal veins (Krajina et al., 2012).

SIGN (2008) recommends that as surgical shunts are not readily available and require specialized surgical skills and because many patients with chronic liver disease are unfit for major surgery, TIPS should be considered to prevent rebleeding when combination of pharmacological and band ligation therapy is not available, cannot be tolerated, or fails. Indications for TIPS procedure include secondary prevention of variceal bleeding, management of refractory cirrhotic ascites, and acutely bleeding varices. Less common indications include management of hepatorenal syndrome and Budd-Chiari syndrome (Haskal, 2011).

As with all radiological procedures, a full assessment of the suitability of a patient to undergo this procedure needs to be undertaken. Numerous absolute contraindications to undertaking this procedure exist, including severe or rapid progressive liver failure; as the procedure involves a reduction of blood flow to the liver, this may worsen liver function and lead to severe or uncontrolled encephalopathy (Kalva et al., 2009). TIPS causes an elevation in right-sided heart pressure and thus should not be performed in patients with diagnosed right-sided heart failure or pulmonary arterial hypertension (Dokoutsidou & Kantianis, 2011; Kalva et al., 2009). The presence of hepatic or systemic infection is also contraindicated for TIPS procedure (Dokoutsidou & Kantianis, 2011).

Relative contraindications include any patient conditions that may increase the technical difficulty in performing the procedure, such as biliary obstruction, hepatic malignancy, portal system thrombosis, inferior vena cava or hepatic vein thrombus, and polycystic liver disease. A raised model for end-stage liver disease (MELD) score calculated using patients' serum creatinine, bilirubin, and international normalized ratio is likewise a relative contraindication (Ferral et al., 2004; Haskal, 2011).

Dokoutsidou and Kantianis (2011) reported that the effectiveness of TIPS can reach up to 100% in a specialized center, and successful outcomes after TIPS are