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Mini Review

A modified incision for upper abdominal surgery in portal hypertension patients: could it avoid portal vein thrombosis?

Wellington Andraus[1], Jan Lerut[2], Rafael S. Pinheiro[1,2]*, Lucas C. Nacif[1], Luciana B. Haddad[1], Paulo Herman[1] and Luiz Carneiro D'Albuquerque[1]

[1]*Department of Gastroenterology, University of São Paulo Medical School, Brazil*
[2]*Starzl Unit of Abdominal Transplantation, University Hospitals Saint Luc, Université catholique Louvain, Belgium*

***Corresponding author**
Rafael S. Pinheiro, Department of Gastroenterology, University of São Paulo, Hospital das Clínicas, Rua Dr. Enéas de Carvalho Aguiar, 255, 9º andar - sala 9113/9114, CEP 05403-900 - São Paulo – SP – Brazil, Tel : 55 11 26613323, Fax: 55 11 2661-6250, E-mail: rsnpinheiro@gmail.com

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Abstract

Background: Portal hypertension is caused by high resistance in portal system due to hepatic fibrosis or pre-sinusoidal obstruction, such as seen in schistosomiasis. The paraumbilical vein recanalization a frequent event in these patients seems to be an efficient portal decompression pathway. A new incision avoiding ligation of the round ligament for major surgeries at the upper abdominal quadrants in portal hypertension patients is proposed: a left subcostal with a small median extension. This incision offers excellent exposure of spleen, stomach, and esophagus whilst keeping the paraumbilical vein intact. This allows to left an adequate flow in portal trunk.

Conclusion: The proposed technical modification proposed is an attractive option because it can reduce the incidence of portal vein thrombosis and postoperative bleeding from esophageal varices.

INTRODUCTION

Portal hypertension is caused by high resistance in the portal system due to hepatic fibrosis or by pre-sinusoidal obstruction, such as seen in schistosomiasis. The higher portal pressure leads to development of porto-systemic shunts. The most frequent sites for these shunts are the esophagus, retroperitoneum, and abdominal wall.

The recanalization of the paraumbilical vein (PUV) serves frequently as a shunt in patients with portal hypertension. This shunt splits part of the blood flow from the left portal branch directly to systemic circulation (Figure 1). The patency of this vein significantly effects in portal pressure, and possibly reducing thereby the incidence of bleeding from esophageal varices and raising the incidence of encephalopathy [1].

Liver transplantation (LT) is the treatment of choice for most cases of portal hypertension. However, portal decompression surgery remains still a good option for patients with preserved hepatic function. Such as patients presenting hepato-splenic form of schistosomiasis, in which combined surgical and endoscopic treatments give the best results to control digestive bleeding. Despite the fact that different procedures have been proposed, the azygo-portal disconnection and splenectomy (APDS) remains the procedure of choice for portal hypertension in patients with schistosomiasis in the majority of specialized centers. Due to the huge size of the spleen, abdominal access usually requires large incisions, such as large median incision or superior-median with bilateral subcostal (*Mercedes)* incision. These incisions always

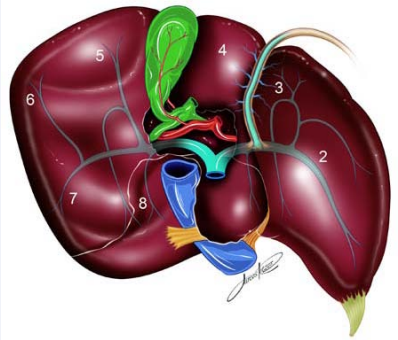

Figure 1 Inferior view of the liver showing a recanalized paraumbilical vein draining the left portal vein branch.

require ligation of the round ligament and consequently the recanalized paraumbilical vein is also interrupted. Regardless APDS is described as feasible by laparoscopy, portal hypertension and collateral vessels render this operation difficult; only a small number of cases have been reported.

Although effective to prevent esophageal bleeding APDS causes portal vein thrombosis (PVT) in about 50% of procedures [2].The ligaturing of recanalized paraumbilical vein may contribute to PVT due to the possible reduced portal trunk flow. Therefore we advocate a left upper abdominal access using a left subcostal incision with a small median extension (*J in mirror shape incision*). This incision offers an excellent view of spleen, stomach and esophagus and avoids the ligation of the recanalized paraumbilical vein.

Technical description

The incision starts at the midline, just below the sternal xyphoid, running 2 cm below the costal arch and it's extended to reach left axillary line (Figure 2). All abdominal wall layers are transected. The paraumbilical vein and the falciform ligament are left intact.

The incision offers an excellent exposure with easy access to splenic vessels, stomach and the distal part of the esophagus (Figure 3). In the case of APDS, splenectomy is associated with the extensive devascularization of the proximal part of the stomach and distal part of the esophagus, including the ligation of the left gastric vein, the short vessels, subdiaphragmatic and esophageal collateral veins. The abdominal wall is closed as usual (Figure 4).

This incision can also be applied to the Warren procedure. Splenic-renal vein anastomosis is indeed feasible whist paraumbilical vein flow is left open.

DISCUSSION

Portal hypertension is defined as a porto-systemic measure difference of 12 mmHg. Recanalization of porto-systemic collateral veins is an attempt to counteract this status. According to the literature, the recanalization of PUV is very variable in cirrhotic patients reaching 7.4% to 80%.

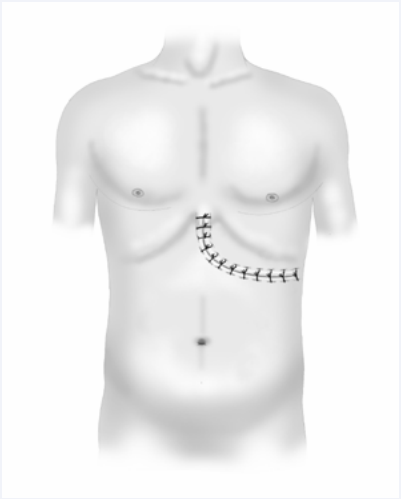

Figure 2 The incision proposed - "J" in mirror shape incision.

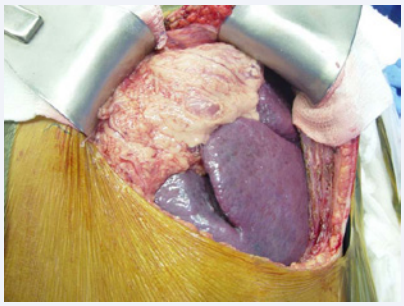

Figure 3 Exposition view showing the spleen and collateral vessels over the stomach.

Figure 4 Patient in the postoperative stage of Azigo-portal disconnection and splenectomy (APDS) with a "J" in mirror shape incision.

PUV has the anatomical advantage that it may drain the left portal branch in three different ways: via the upper epigastric vein, which drains into internal thoracic vein and also to brachiocephalic trunk and upper caval vein; via the inferior epigastric vein, which drains to the external iliac vein and so to inferior caval vein; and finally via the superficial epigastric vein, which drains to the saphena magna vein and so to femoral, external iliac and inferior caval veins.

A PUV recanalized may lower the incidence of bleeding from esophageal varices. Although some studies have failed to demonstrate so, the incidence of thick esophageal varices seems to be lower in patients presenting significant paraumbilical shunt. Zardi et al. analyzed the presence of spontaneous shunts in 326 cirrhotic patients by Doppler ultrasonography and endoscopy; these authors observed that patients with recanalized PUV lack large-caliber esophageal varices and they also have a lower incidence of medium caliber esophageal varices [3].

Gupta et al. identified a significant association between the presence of a recanalized PUV and a lower incidence of esophageal large and medium caliber varices. Moreover, there is an association between PUV and hepatic encephalopathy, a finding which indicates a significant portal system decompression [1].

One of the consequences of portal hypertension is to slow the blood flow and is a risk factor for portal vein thrombosis. A study of portal hypertension due to schistosomiasis demonstrated that patients with large sized PUV had a faster portal vein blood flow velocity. This finding goes along with a possible protection

against PVT [4]. Verma et al. retrospectively evaluated the MR scans of 309 patients waiting for LT. They observed that patients with PUV recanalization had a lower incidence of PVT [5].

Fewer adherences at the upper-right abdominal side is another benefit of the described approach, as it makes easier the possible following LT procedure.

In conclusion, the proposed technical modification might be an attractive option in portal hypertension patients as it does not interfere with the surgical procedure; and as it allows keeping an efficient via of portal decompression and as it may reduce incidence of PVT and variceal bleeding.

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