TRANSJUGULAR INTRAHEPATIC PORTOSYSTEMIC SHUNT: A CASE REPORT

P S Goh, L Tan, R Guan

ABSTRACT

Of the various methods currently available to manage potentially life threatening bleeding from oesophagogastric varices, surgical portosystemic shunts are recognised to have the lowest incidence of rebleeding though surgery is associated with high morbidity and mortality.

Recently, a promising non-surgical technique has been developed to create an intrahepatic portosystemic shunt via a percutaneous transjugular route.

This paper presents a case report of this region's first transjugular intrahepatic portosystemic shunt procedure and briefly reviews the development and preliminary results of this technique.

Keywords: portal hypertension, variceal bleeding, intravascular stents, portacaval shunt.

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INTRODUCTION

Bleeding from oesophago-gastric varices is a life threatening complication of portal hypertension. At present, the therapeutic options to control acute and recurrent bleeding include intravenous vasopressin, somatostatin, endo-oesophageal tube balloon tamponade, endoscopic sclerotherapy, angiographic embolisation, and the various forms of portosystemic shunts as elective surgical procedures to prevent recurrent variceal bleeding.

Whilst surgical portosystemic shunts are associated with the lowest incidence of rebleeding[1,2], high morbidity and mortality associated with this procedure prevents its use as a first option treatment.

Recently, there has been renewed interest in the form of a non-surgical method to create a portosystemic shunt. This method uses a percutaneous transjugular route to form a intrahepatic portocaval shunt, which is then kept patent by an expandable metallic stent. This achieves a reduction in portal venous pressure and reduces the risk of bleeding. The preliminary results of groups working in North America[3-5] and Germany[6] have been particularly encouraging.

We report the first local insertion of a percutaneous transjugular intrahepatic portosystemic shunt (TIPS) in a patient with hepatitis B cirrhosis and recurrent variceal bleeding. In this case report, the technique used is presented with a discussion of its evolution and possible future role in the management of patients with portal hypertension.

CASE REPORT

Our patient was a 52-year-old Chinese man with cirrhosis, proven by biopsy, from chronic hepatitis B infection; Child B according to Child's classification. He had undergone 4 courses of endoscopic injection sclerotherapy over the past 18 months for the treatment of recurrent variceal bleeding, but had been judged a poor candidate for future sclerotherapy due to extensive oesophageal ulceration at the last treatment session.

Whilst in hospital convalescing after successful treatment of an acute urinary tract infection complicated by methicillin resistant staphylococcal aureus septicaemia and liver failure, he was offered and he agreed to have a TIPS procedure to prevent further variceal bleeding.

The technique involved the percutaneous puncture of the right internal jugular vein under local anaesthesia[7]. A catheter (9-F angiographic sheath) was manipulated through the right atrium and proximal inferior vena cava (IVC) into the middle hepatic vein (MHV).

With the help of a curved Colapinto transjugular needle (16-gauge needle within a 7.5F catheter), access to the right portal vein (RPV) from the middle hepatic vein (MHV) was achieved by advancing the needle through the sheath and directed anteriorly under fluoroscopic guidance through the liver parenchyma into the porta vein branch. A guide wire (GW) was then manipulated from the IVC and MHV through the liver parenchymal tract created, down the RPV into the main

Fig 1 - A guidewire (GW) passing from the IVC through the middle hepatic vein and liver parenchymal tract into the right portal vein and down the main portal vein (PV).

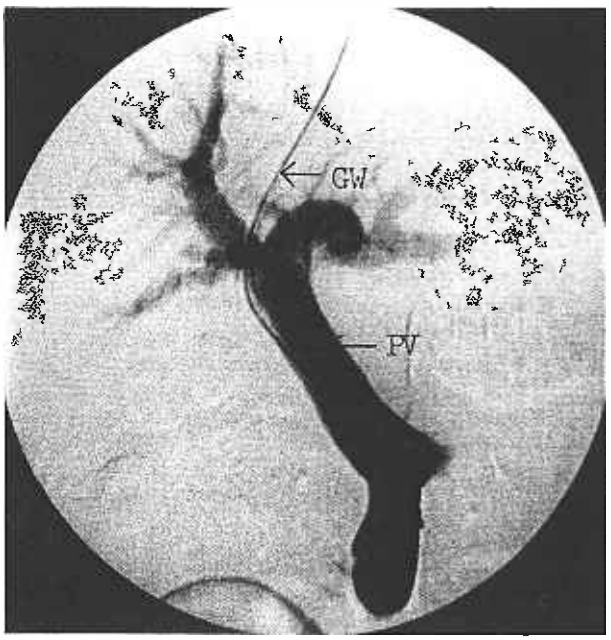

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Fig 2 - A balloon expandable Wallstent in situ within the liver parenchymal tract.

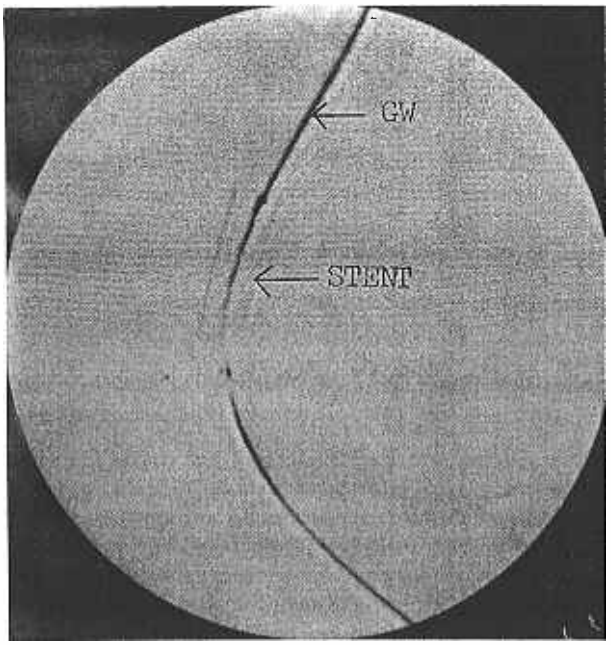
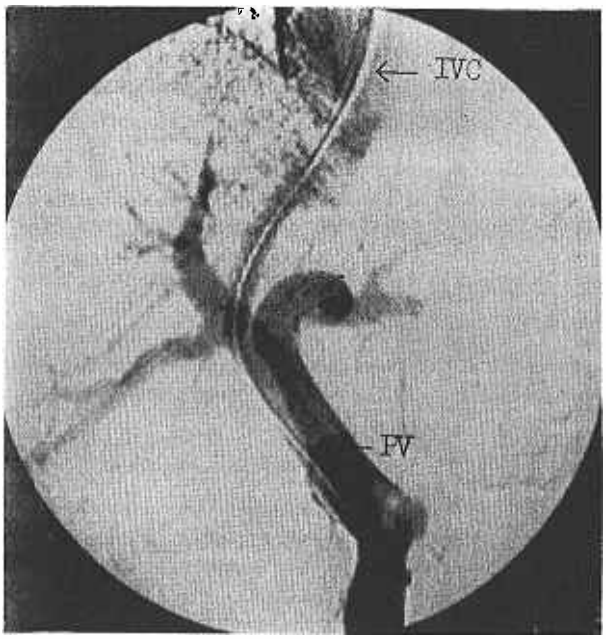


Fig 3 - Radioopaque contrast media injected into the portal vein (PV) outlining the intrahepatic portal venous branches.



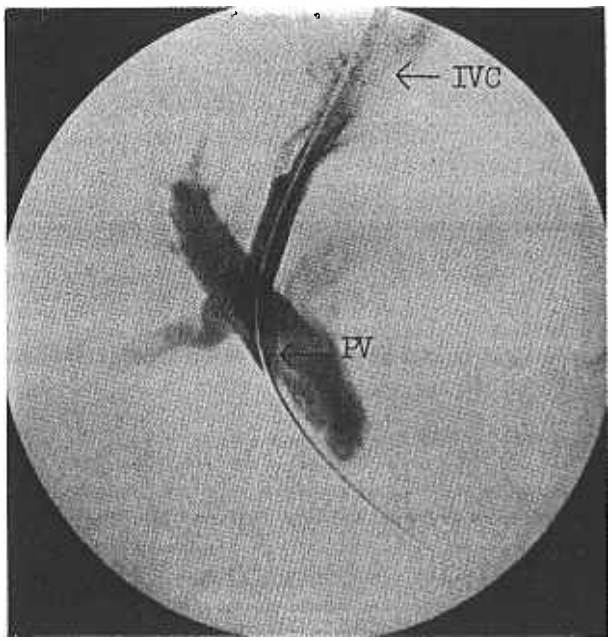
portal vein and the needle removed (Fig 1).

The liver parenchymal tract was then dilated using a balloon angioplasty catheter to 8 mm, and an expandable metallic Wallstent was placed across the connection between the MHV and RPV to maintain patency of the tract (Fig 2). The angioplasty balloon was then used to distend the parenchymal segment of the stent to 8 mm.

A subsequent portocavogram demonstrated brisk flow from the portal vein through the stent shunt into the IVC (Fig 3 and 4).

The patient was ambulant after the procedure and remained well during observation in hospital. He has remained clinically well on outpatient follow-up 11 months after the procedure,

Fig 4 - The Metallic stent lined parenchymal tract leading from the RPV to IVC via the MHV. Brisk flow with rapid clearing of contrast into the IVC is noted.



and has had no further episodes of haematemesis.

DISCUSSION

The first successful non-surgically created intrahepatic portosystemic shunt in dogs[8] was first reported by Josef Rosch in 1969. Colapinto et al in 1982 reported the first successful transjugular intrahepatic shunt procedure in a patient[9].

Since these two landmark reports, interest in the procedure waned as closure of the liver parenchymatous tract presented a major problem.

A major technical breakthrough occurred in 1985 with Palmaz et al reporting the introduction of percutancously inserted metallic stents to keep the shunt patent in an animal model[10]. This was followed by preliminary reports on the use of a variety of stents in humans published in the past year from groups in North America and Germany[5,6]. The metallic stents currently being evaluated are balloon expandable stents made from a fine stainless steel mesh and woven into a fine crisscrossed interlaced pattern[10].

A review of initial results on the follow-up of small groups of patients reported in the literature up to 9 months post-shunting have been encouraging. In all cases, significant reduction of the portosystemic pressure gradient was achieved with marked reduction of the oesophago-gastric varices on follow- up gastroscopy. As reported, the average portosystemic pressure gradient was lowered from 36 mmHg to 11 mmHg[5] and 34mmHg to 20 mmHg[6]. No patient developed haematemesis though one patient with rectal bleeding from haemorrhoids responded to increasing the shunt calibre from 8 to 12 mm with a percutaneous balloon catheter thus further reducing the portosystemic pressure gradient[5].

Technical success was achieved in all patients in the latest studies[5,6]. All shunts have remained patent on 3 - 9 month follow-up and no recurrent episodes of haematemesis have been reported.

The procedure is relatively easy to perform, necessitating only local anaesthesia and light sedation. As the procedure requires only a jugular venepuncture, there is little risk of haemorrhage even if the patient has a significantly impaired

clotting profile. Traversing a hepatic artery branch or biliary radicle during the parenchymal puncture could theoretically cause hemobilia or an arteriovenous fistula, but these complications have not been reported. Conceivably, the expanded metallic stent prevents bleeding by compressing and tamponading vessels within the parenchymal tract. Ascites and abnormal liver function tests do not alter the technique and apparently do not affect the outcome. As the parenchymal puncture is made entirely within the liver, ascites do not pose additional technical risks.

To date, no significant complications have developed. In particular, no cases of hepatic encephalopathy have yet been reported, possibly related to the small calibre of the intrahepatic shunt[11,12]. A case each of shunt stenosis and shunt migration have been reported but were effectively treated percutaneously[5].

CONCLUSION

In conclusion, TIPS offers the exciting promise of an effective and safe method for reducing portal venous pressure in patients with cirrhosis and portal hypertension, especially in the further management of patients with recurrent variceal bleeding and not responding well to injection sclerotherapy. At present, insufficient numbers of patients have been treated using this technique to allow for firm conclusions. The long term results of this new technique need to be fully evaluated.

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