The Application of Prostaglandin E\textsubscript{1} Indirect Portal Vein Angiography and Color Doppler Ultrasound in Patients with Post-devascularization Portal Hypertension

PENG Zhi-hai (彭志海)
Department of Surgery, Tongji Hospital, Tongji Medical University, Wuhan 430030
ZHANG Min-xiang (张民祥)
Department of Surgery, Boxing County Hospital, Shandong province 256000

Summary: The selection of proper treatment is based on identification of the causes of massive hemorrhage of gastrointestinal tract after pericardial devascularization. The combined use of prostaglandin E\textsubscript{1} indirect portal vein angiography, DSA of celiac artery and color Doppler can provide detailed information about portal vein system, including the presence of embolism, spongioid changes and devascularization of left gastric vein and left gastric artery and the direction of blood flow. If these techniques failed to reveal the causes of digestive tract bleeding, the endoscopy may show lesions of gastric mucosa, which could be accountable for the bleeding.

Key words: prostaglandin E\textsubscript{1}, angiography, Doppler effect, portal vein, hypertension

The long-term recurrence rate of bleeding after pericardial devascularization was reported to be 13.3\%\cite{[1]. Some patients, due to some reasons, did not received standard devascularization procedure and the incidence of recurrent bleeding could be higher in those patients. The management of recurrent bleeding has been a difficult problem in clinical practice. Prostaglandin E\textsubscript{1} indirect portal vein digital subtraction angiography (DSA), angiography of celiac artery in combination with color Doppler flow image are techniques for establishing the causes of the bleeding in those patients.

MATERIALS AND METHODS

Equipment and Methods
Shimazu DAR-100A type DSA, 1250 mA and HD-150G-40 angiography apparatus (Shimazu, Japan) were employed as visualizing equipment. The DSA of celiac artery was performed and followed by routine indirect portal vein DSA through superior mesenteric vein (SMV). Lastly, 20 \mu g PGE\textsubscript{1} was injected via a tube and 30 min after injection the indirect portal vein DSA was performed. The time-density curve was made for visualized main portal vein, superior mesenteric vein (SMV), left gastric vein (LGV).

Spectra bifunctional color Doppler was used for CDFI with a 3.5—7.5 MHz transducers as scanner. The patients had fasted for 12 h before examination. The measurement was conducted at midpoint of MPV and for SMV at a point 1—2 cm below the conjunction between MPV and spleen vein.

Patient Selection
Ten patients (1 female and 9 male) were included in the study with age ranging from 12—28 y. All the patients had post-hepatitis cirrhosis portal vein hypertension and suffered from massive gastrointestinal bleeding at least once after devascularization procedure. The interval between the surgery and recurrent bleeding ranged from 3 months to 7 years averaging 29.9 months. All patients were first subjected to CDFI and the PGE\textsubscript{1} indirect portal vein DSA and DSA of celiac artery were performed within 1—3 days.

RESULTS

Of 10 patients in our series, 2 revealed spongioid change of MPV, which could be visualized by both techniques. Figure 1 shows the angiogram of CDFI. One case had occlusion of MPV, 1 had occlusion of MPV and right branch of portal vein and 1 showed occlusion of left branch of portal
vein. All occlusions were partial ones and only visualized by CDFI. The visualization were poor with indirect portal vein DSA. DSA of celiac artery revealed failed devascularization of left gastric artery in 1 case (fig. 2) while the CDFI did not display the finding. The PGE1 indirect portal vein DSA indicated that 3 cases had undevascularized left gastric vein (fig. 3), two of them were shown to have visualized LGV by CDFI. One case in our series revealed no cause of bleeding by above-mentioned techniques. The TDC of indirect portal vein DSA and signals of CDFI showed hepatofugal flow in MPV and SMV and hepatopetal flow in LGV (fig. 4).

The main portal vein flow (MPVF) in two cases could not be measured. The average MPVF of the other 8 cases was $988.67 \pm 252.36$ ml/min. We had measured MPVF