Membranous Obstruction of the Inferior Vena Cava Treated by Percutaneous Balloon Angioplasty

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A 30-year-old Chinese man (case 5), who underwent surgical sympathectomy 12 years earlier for Budd-Chiari syndrome, developed recurrence of progressive ascites, dyspnea, leg edema, and esophageal varices over the past 5 years. Angiography revealed incomplete membranous obstruction of the inferior vena cava just below the right atrium (Fig 1A). The obstruction was successfully relieved by percutaneous transluminal angioplasty (Fig 1B). The patient remained asymptomatic for a follow-up period of 3.5 years.

A 32-year-old Chinese woman (case 9), with almost identical symptoms as the previous patient, was shown

![Fig 1. Inferior vena cavogram (case 5) shows a membranous obstruction of the inferior vena cava (MOVC) 1 cm below the right atrium (arrowhead in A) with caval dilatation below the obstruction and ample collaterals. After percutaneous transluminal angioplasty (PTA), the caval diameter at the site of MOVC increases from 2 to 20 mm (arrowhead in B); the caval diameter below the MOVC decreases from 48 to 40 mm; the collaterals have completely disappeared; and the right atrium, which is barely visualized before PTA, is now well opacified.](image-url)
on angiography to have complete membranous obstruction of the inferior vena cava just below the level of the diaphragm (Fig 2A). The obstruction was successfully relieved by percutaneous transluminal angioplasty (Fig 2B). The patient remained asymptomatic for a follow-up period of 2.5 years. These two patients were among the 30 patients with membranous obstruction of the inferior vena cava whom we have successfully treated by percutaneous transluminal angioplasty with the Inoue balloon catheter. With the exception of one patient (case 8), who died from massive pulmonary embolism occurring immediately after percutaneous transluminal angioplasty, there were no complications. Long-term results with a follow-up period of as long as 5 years have been very satisfactory.

![Image](http://circ.ahajournals.org/)

**Fig 2.** Inferior vena cavogram in case 9 shows complete membranous obstruction of the inferior vena cava (MOVC) just below the level of the diaphragm (arrowhead in A) with profuse collaterals below the MOVC; the right heart is opacified by simultaneous right atrial angiography through a National Institutes of Health catheter introduced through the superior vena cava. After successful PTA (B), the caval diameter below the MOVC decreases from 29 to 21 mm; the collaterals have disappeared; and the right heart can now be visualized readily after contrast injection into the inferior vena cava.
Images in cardiovascular medicine. Membranous obstruction of the inferior vena cava treated by percutaneous balloon angioplasty.

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