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## THE SURGEON AT WORK

### DEVELOPMENT OF A SUPRAHEPATIC RECIPIENT VENA CAVA CUFF FOR LIVER TRANSPLANTATION

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ONE of the most difficult parts of orthotopic transplantation of the liver is construction of the upper vena caval anastomosis at the diaphragm. The problems are caused by the recipient disease. With chronic hepatic disorders, there often is foreshortening and distortion of the suprahepatic inferior vena cava as well as retraction of the main hepatic veins into the scarred liver (Fig. 1A and B). Consequently, when orthotopic transplantation of the liver is performed, development of a long enough suprahepatic vena cava cuff for anastomosis to its homograft counterpart has ranged from trying to almost impossible. We report here in a technical solution which has been used in the last 12 instances.

The host liver is devascularized and mobilized by techniques described before, including cross clamping of the infrahepatic inferior vena cava (1, 2). The suprahepatic vena cava is encircled and cross clamped, but no attempt is made initially to mobilize the desired length for cuff development (Fig. 1A). Instead, an anterior vertical incision is made in the cirrhotic liver (Fig. 1A), and with knife dissection, this is carried directly posterior to the vena cava which is scraped clean (Fig. 1B). Working from within the split

cirrhotic parenchyma, the left hepatic vein is found, clamped and closed with a double layer continuous vascular suture (Fig. 1B and C). The vena cava and right hepatic vein usually are joined into a cloaca (Fig. 1C) which serves as the cuff (Fig. 1D) for later anastomosis. Before proceeding, the cuff should be searched for defects, such as entry points of small transected veins. These are sutured.

Variations are possible. The right hepatic vein may be closed with creation of a cloaca from the vena cava and left hepatic vein or both main hepatic veins can be closed, leaving the cleaned and transected intrahepatic vena cava for anastomosis. This last option is advisable only if the homograft suprahepatic vena cava to be sewed to is smaller than usual.

The described technical modification permits dangerous dissection of the suprahepatic vena cava to be avoided, while assuring adequate cuff development. The use of this seemingly minor technical modification has had a major effect upon the ease of liver transplantation and has improved the quality of this relatively inaccessible venous anastomosis.

#### REFERENCES

1. STARZL, T. E. *Experience in Hepatic Transplantation*. Philadelphia: W. B. Saunders, Co., 1969.
2. STARZL, T. E., PORTER, K. A., PUTNAM, C. W., and others. Orthotopic liver transplantation in 93 patients. *Surg. Gynecol. Obstet.*, 1976, 142: 487.

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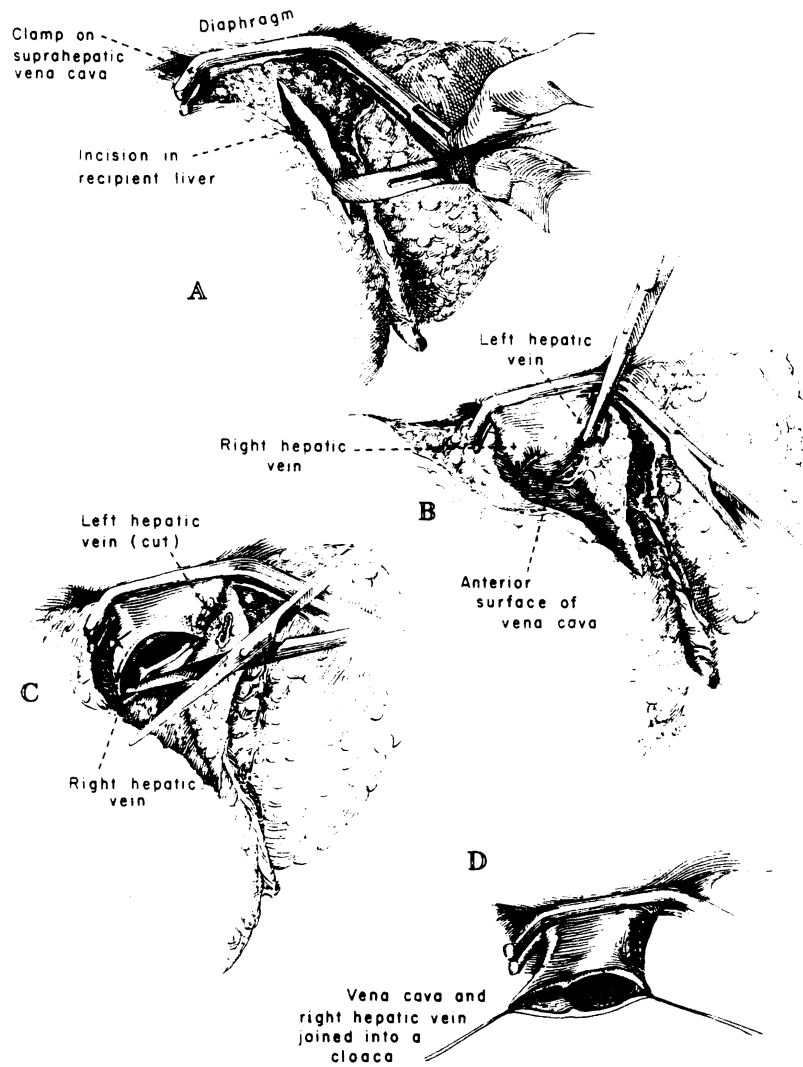


FIG. 1. Steps for the development in a liver recipient of an adequate suprahepatic vena cava cuff.

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