A SIMPLIFIED TECHNIQUE FOR REVASCULARIZATION OF HOMOGRAFTS OF THE LIVER WITH A VARIANT RIGHT HEPATIC ARTERY FROM THE SUPERIOR MESENTERIC ARTERY

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Fig. 1. Split arterial supply to the liver originating from the left gastric, celiac and superior mesenteric arteries. L.H.A., Left hepatic artery; c.d., Common duct; h.a., Hepatic artery; L.G.A., Left gastric artery; s.m.v., Superior mesenteric vein; s.m.a., Superior mesenteric artery; s.a., Splenic artery; L.R.A., Left renal artery; p.v., Portal vein.

Fig. 2. A patch of anterior aorta including the origins of the celiac axis and superior mesenteric artery is removed. The renal artery orifices are protected. c.a., Celiac axis; R.R.A., Right renal artery; L.R.A., Left renal artery; s.m.a., Superior mesenteric artery.

Fig. 3. Folding of the aortic patch permits safe anastomosis of the celiac axis to the superior mesenteric artery.

Fig. 4. The superior mesenteric artery distal to the right hepatic artery is used for anastomosis to the recipient artery. recip. ha., Recipient hepatic artery; s.m.a., Superior mesenteric artery; R.H.A., Right hepatic artery; s.a., Splenic artery; h.a., Hepatic artery; L.H.A., Left hepatic artery; P.V., Portal vein; c.a., Celiac axis.

Fig. 5. The reconstructed arterial supply of the graft may be rotated to match the orientation of the host vessel. L.H.A., Left hepatic artery; P.V., Portal vein; h.a., Hepatic artery; R.H.A., Right hepatic artery; s.m.a., Superior mesenteric artery; recip. h.a., Recipient hepatic artery.

A Simplified Technique for Revascularization of Homografts of the Liver with a Variant Right Hepatic Artery from the Superior Mesenteric Artery.—Robert D. Gordon, Byers W. Shaw, Jr., Shunzaburo Iwatsuki, Santuro Todo and Thomas E. Starzl.
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In most instances, the arterial supply of the liver is provided by right and left lobar branches of the hepatic artery, one of the three principal branches of the celiac axis. However, variations from this typical pattern were reported in 45 per cent of instances reviewed by some (1) and in 46.5 per cent of instances reviewed by others (2).

Most variations in hepatic arterial supply appear to derive from incomplete development of the celiac axis resulting in replacement of the missing hepatic supply from other sources (1). The most common anomalies are a left hepatic branch from the left gastric artery and a right hepatic branch from the superior mesenteric artery. Even when well developed right and left hepatic arteries are present, accessory branches from the left gastric and superior mesenteric arteries may be present. Since all hepatic arteries are terminal vessels serving exclusive territories of the liver, even accessory vessels must be preserved during transplantation of the liver.

In the past, we have described techniques of dealing with a variant blood supply of livers prepared for transplantation (3, 4). The principle has been to reconstitute a single vessel for eventual anastomosis in the recipient. The most difficult anomalies have been with a split arterial supply originating from the celiac axis and the superior mesenteric artery. We report herein a method of reconstruction with which these two vessels of origin can be easily reconstructed into a common channel.

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liac and superior mesenteric arteries is notched on each side at the midportion leaving a small bridge of aorta intact between the vessels (Fig. 3). A vascular suture (6-0 polypropylene) is secured at each end of the bridge, sewn around to the opposite side, and tied (Fig. 4). The folding together of the modified Carrel patch with a small intact bridge of aorta permits anastomosis of the celiac and superior mesenteric arteries without misalignment or twisting and it eliminates the danger of stenosis resulting from tension on sutures.

ANASTOMOSIS IN RECIPIENT

The end of the superior mesenteric artery distal to the right hepatic branch is anastomosed to the recipient artery (Fig. 4). The reconstructed graft arterial supply may have to be rotated depending upon the orientation of the host artery (Fig. 5).

This technique of converting a complex arterial supply into a single vessel has now been used since 26 June 1984 in eight instances. There have been no subsequent thromboses or technical failures of other kinds. Some liver transplantation teams which are acquiring their first experience have had a policy of discarding livers with this anomaly, but with the simple technique described herein, this wastage can be avoided and without risk to the recipient.

SUMMARY

A simplified technique for conversion of a complex hepatic arterial supply into a common channel is described. This technique permits single vessel anastomosis in the recipient of a liver transplant.

REFERENCES