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A technique for hepatic artery anastomosis during orthotopic liver transplantation

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Abstract Hepatic artery thrombosis remains the most common technical complication that causes graft failure following orthotopic liver transplantation. The Hepatic artery anastomosis should be performed using meticulous technique and adequate magnification. We report a very low incidence of Hepatic artery thrombosis (1.3 %) utilising a modified microvascular 120° triangulat-

ing technique in 150 adult liver transplants.

Key words Hepatic artery, liver transplantation · Vascular anastomosis

Introduction

Arterial reconstruction during orthotopic liver transplantation is an important step that influences the success of the procedure [1]. The reconstruction is dependent upon the anatomy and size of the donor and recipient hepatic artery. Recognition of anatomical variants and knowledge of appropriate techniques of vascular anastomosis are essential [3]. The techniques of vascular anastomosis used in liver transplantation have been taken from various sources. We have modified the technique used by microvascular surgeons for end-to-end vascular anastomosis. The technique described below is particularly useful when the donor and recipient arteries are thin-walled with a small diameter.

Technique and Discussion

A total of 480 orthotopic liver transplantations were performed between October 1989 and November 1993. The suture material used for arterial anastomosis was either 6/0 or 7/0 polypropylene (Prolene). We modified the 120° triangulating technique used by microvascular surgeons [2]. The technique involved the placing of

three sutures at 120° intervals around the circumference of the arteries to be anastomosed (Fig. 1). In microvascular anastomoses, the three 120° stay sutures are used to rotate the vessels, allowing completion of the anastomosis without catching the opposite wall of the vessel. This technique is limited in its usefulness for hepatic artery anastomosis in liver transplantation by the shortness of the recipient common hepatic artery stump. The application of a proximal vascular clamp further limits the surgeon's ability to rotate the vessel whilst completing the anastomosis.

Our modification overcomes this problem by placing two adjacent sutures in the posterior aspect of the two vessels to be anastomosed and using them as posterior stay sutures on either side of the artery. Two additional sutures are placed at 120° anterior to these sutures, but they are not tied (Fig. 2). The two posterior stay sutures prevent the posterior wall from being caught by the anterior sutures. Interrupted sutures are then placed between the posterior suture and the corresponding anterior 120° suture on each side without the need to rotate the short stump of the recipient hepatic artery. This technique has been particularly useful when the recipient hepatic artery is short, of small diameter, and thin-walled. Bleeding from these interrupted suture lines has not been a problem. An additional advantage of

Fig. 1 Microvascular 120° triangulating technique

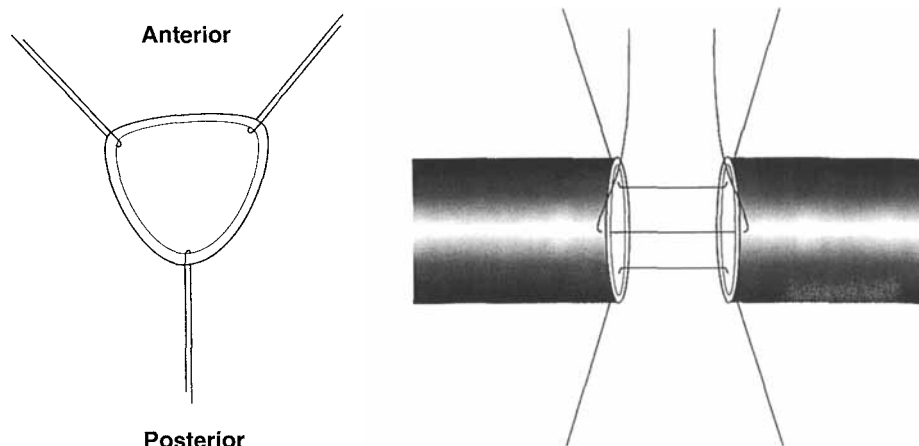
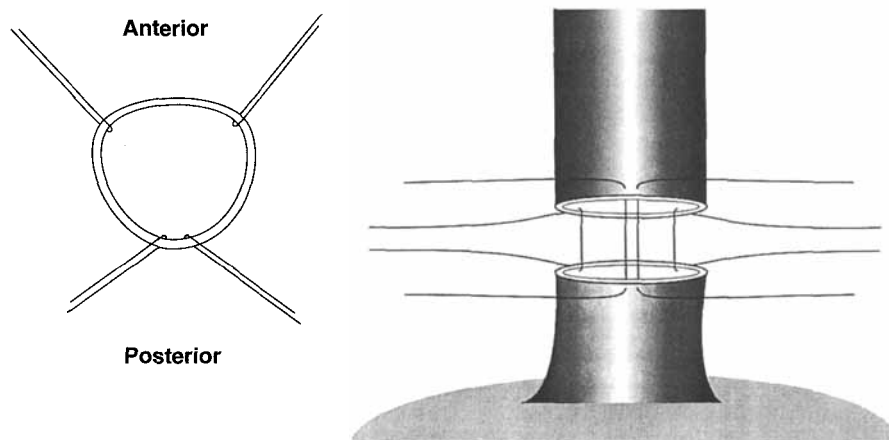


Fig. 2 Modification of the microvascular triangulating technique with two posterior stay sutures. Two additional sutures are placed at 120° intervals from the initial two sutures and are left untied until completion of the anastomosis



the technique is that angioplasty in the early postoperative period is not contraindicated.

The technique was used in 150 of the last 230 consecutive adult orthotopic liver transplantations. An iliac arterial conduit or a continuous 6/0 prolene suture was used in the remaining 80 patients. There were two cases of hepatic artery thrombosis in the group of 150 pa-

tients. One patient was successfully retransplanted and in the second, a prompt diagnosis led to early revascularization with an iliac arterial conduit and subsequent salvage of the graft. There were seven deaths in this group, but none of them was due to arterial complications.

References

1. Brems JJ, Millis JM, Hiatt JR, Klein AS et al (1989) Hepatic artery reconstruction during liver transplantation. *Transplantation* 47: 403–406
2. McC O'Brien B (1987) End-to-end anastomosis. In: McC O'Brien B (ed) *Reconstructive microsurgery*. Churchill Livingstone, London, pp 31–51
3. Shaw BW, Iwatsuki S, Starzl TE (1984) Alternative methods of arterialization of the hepatic graft. *Surg Gynecol Obstet* 59: 491–493