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“In-Site” Perfusion Technique for Rinse Solution in Liver Transplantation

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Flash or rinse solution use in liver transplantation has gathered much interest to prevent ischemia-reperfusion injury.¹ Several solutions have been applied for clinical testing, but they remain controversial.² Pratschke et al² recently reported from a prospective randomized multicenter trial using Tacrolimus rinse based with histidine-tryptophan-ketoglutarate preservation solution for marginal liver grafts. Unfortunately, they concluded that the tested rinse solution failed to improve the primary endpoint of the study.

However, I would like to discuss some key points regarding such “Ex-site” back table perfusions. They administered a total of 10 000 mL of the rinse solution sequentially to the portal vein and the common hepatic artery at the end of the back table. The total duration of the procurement was 18.1 ± 7.3 minutes (mean ± SD). However, some details remain unknown. For example, what was the temperature of the solution at the end of infusion? The ideal temperature of flash solution is still debated from based on available experimental data.³ How much warm ischemia time does it take for vascular reconstruction of suprahepatic inferior vena cava (IVC) and portal vein of the perfused liver graft? Although the temperature of the cold liver graft is increased during vascular anastomosis in the recipient, the function of the liver graft would get worse and worse. Even if the rinse solution has a benefit for reperfusion injuries, the marginal graft might fall into a vicious cycle without oxygen and nutritional supply until blood circulation is restored. Therefore, it would be worthwhile to control the temperature of the liver graft put in the recipient by the hypothermic or subnormothermic perfusion.

Following recent studies,^{4,5} suggesting a potential benefit of subnormothermic preservation and perfusion culture, we recently developed new “In-site” perfusion protocol and system

in collaboration with the Institute of Physical and Chemical Research group (Tsuji and Ishikawa) and SCREEN Holdings Co., Ltd. (Yoshimoto, Torai, and Nadahara) (Figure 1). This protocol and system allows for continuous infusion of the rinse solution for the liver graft from the anatomical point of view of the liver.

Despite the negative results obtained by the TOP study of Tacrolimus rinse for marginal liver grafts, it might help to

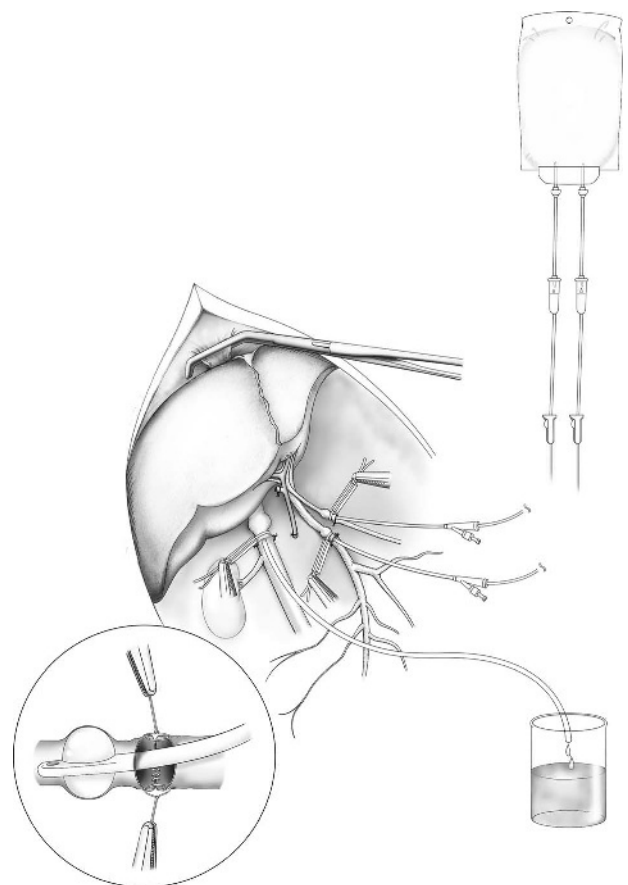


FIGURE 1. Recipient's liver is removed while donor liver is completely procured at the back table. Perfused liver is put in and suprahepatic IVCs of donor and recipient is completed. Later, portal vein and infrahepatic IVC will be reconstructed while the rinse solution is continuously infused. Vascular anastomosis can be completed while inserting the infusion or drainage tube into the vessel. Blood flow from the recipient will be resumed immediately after the inserted tube is removed.

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improve the surgical protocol during transplantation to reduce ischemic-reperfusion injury and to expand the donor pool.

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