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Knack & pitfalls in making a mouse model of small intestinal transplantation

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In organs transplantation, mouse models are useful tools to analyze transplant biology and immunology because of their well-recognized genetic background and existence of abundant antibodies. At our department, we have been conducting basic research on intestinal transplantation using mouse model. The important steps for successful surgery are (1) to harvest procure a high-quality graft while maintaining blood pressure with minimal blood loss during donors surgery, and (2) to complete vascular anastomoses in approximately 20-25 minutes. Accordingly, we have performed the procedure as the following. Briefly, in donor surgery, appropriate length of small intestine is disconnected after the colon is removed to the outside of the body. The portal vein is dissected all the way up to the hepatic hilum. After right renal artery and infrarenal aorta are ligated, cross-clamping the aorta just below the celiac artery is performed. Immediately after cross-clamping, graft should be perfused with cold heparinized saline by puncturing the aorta. The portal vein and the aorta are transected and the graft is procured. At back table, we prepare the superior mesentery artery (SMA) with the carrel patch for the anastomosis. In recipients surgery, after the infrarenal-aorta and -inferior vena cava (IVC) are clamped, vascular anastomoses between donor PV and recipient IVC with 10-0 Nylon and between donor SMA and recipient aorta with 11-0 Nylon are performed using continuous suture technique with the aid of microscope. According to our protocol, we can achieve a perioperative survival rate close to 100% after a several month training period. We will introduce our protocol and present detailed procedure.