“Asia's first case- 8-year-old girl gets rid of dialysis by transplanting adult kidney into hepatic venous routes”, Taipei Veterans General Hospital Sets Organ Transplant Record

Kidney Transplant from Deceased Adult Donor to 8-Year-Old girl via her hepatic venous routes

The kidney transplant team at Taipei Veterans General Hospital successfully transplanted an adult kidney into a child's liver by using the method of "creating something out of nothing, splitting the liver for kidney transplant". They divided the patient's liver and found a healthy hepatic vein, and then used a donor vein to create an extension channel to anastomose with the patient's renal vein, thus successfully transplanting the adult kidney into the liver of a child with low body weight (Figure 1), and helping the patient, an 8-year-old girl named Wu, get rid of her lifelong dialysis shackles. A literature search revealed only two cases of extension vessel grafting to the hepatic vein. Both cases were performed in the United States and this is the first case in Asia.

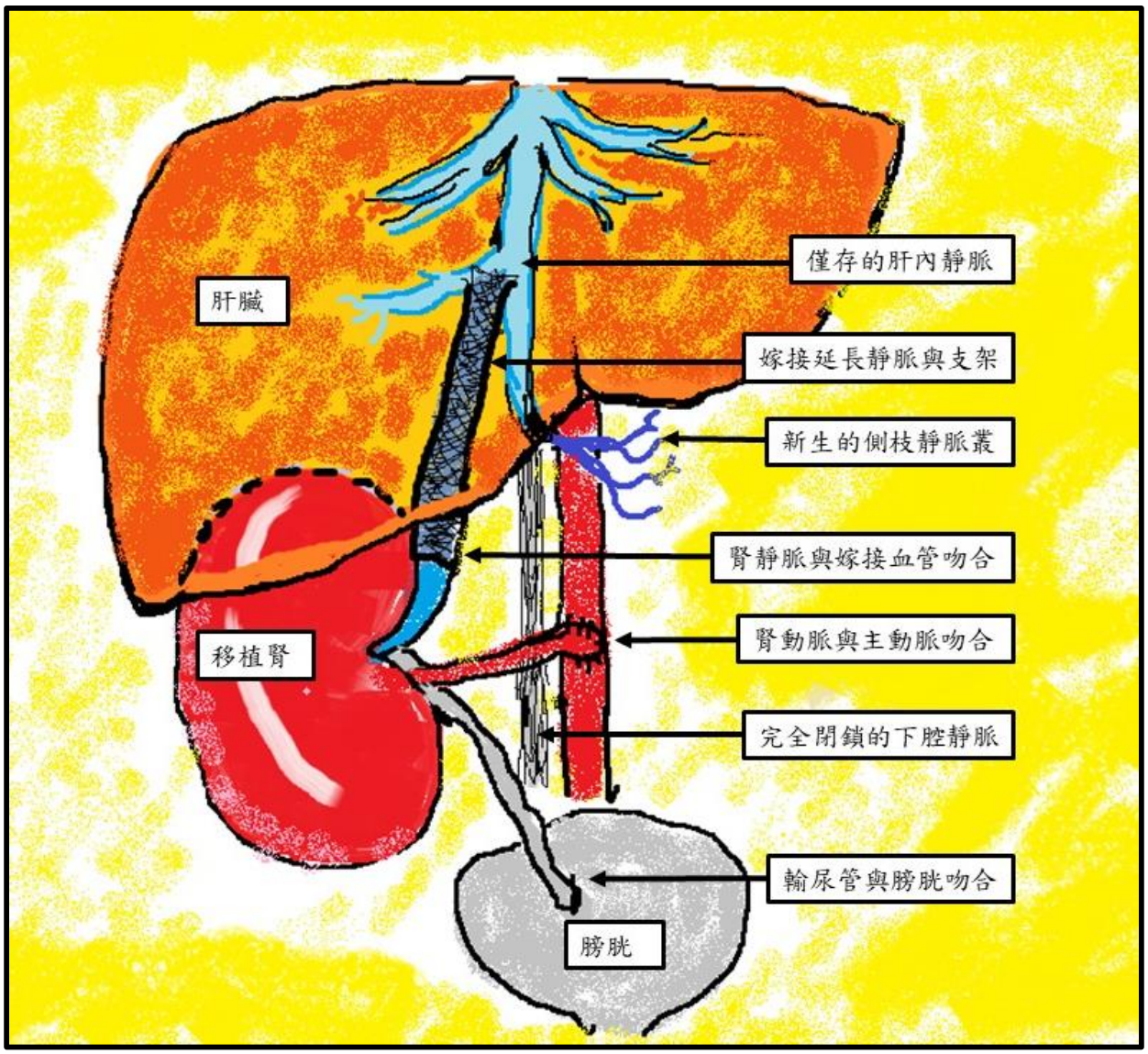

Figure 1 Schematic diagram of operation

At the age of 2.5 years, Wu was diagnosed with a rare bilateral Wilms' tumor (Figure 2), a malignant tumor of the kidneys. The cause of the disease is related to genetic mutations, and it most commonly presents in young children as an asymptomatic large intra-abdominal tumor, which in advanced stages can cause abdominal pain or inability to eat due to compression of other organs. The only treatment for this disease is surgical removal of the entire kidney followed by chemotherapy. After both kidneys are removed, peritoneal dialysis and hemodialysis are required to remove toxic metabolic waste.

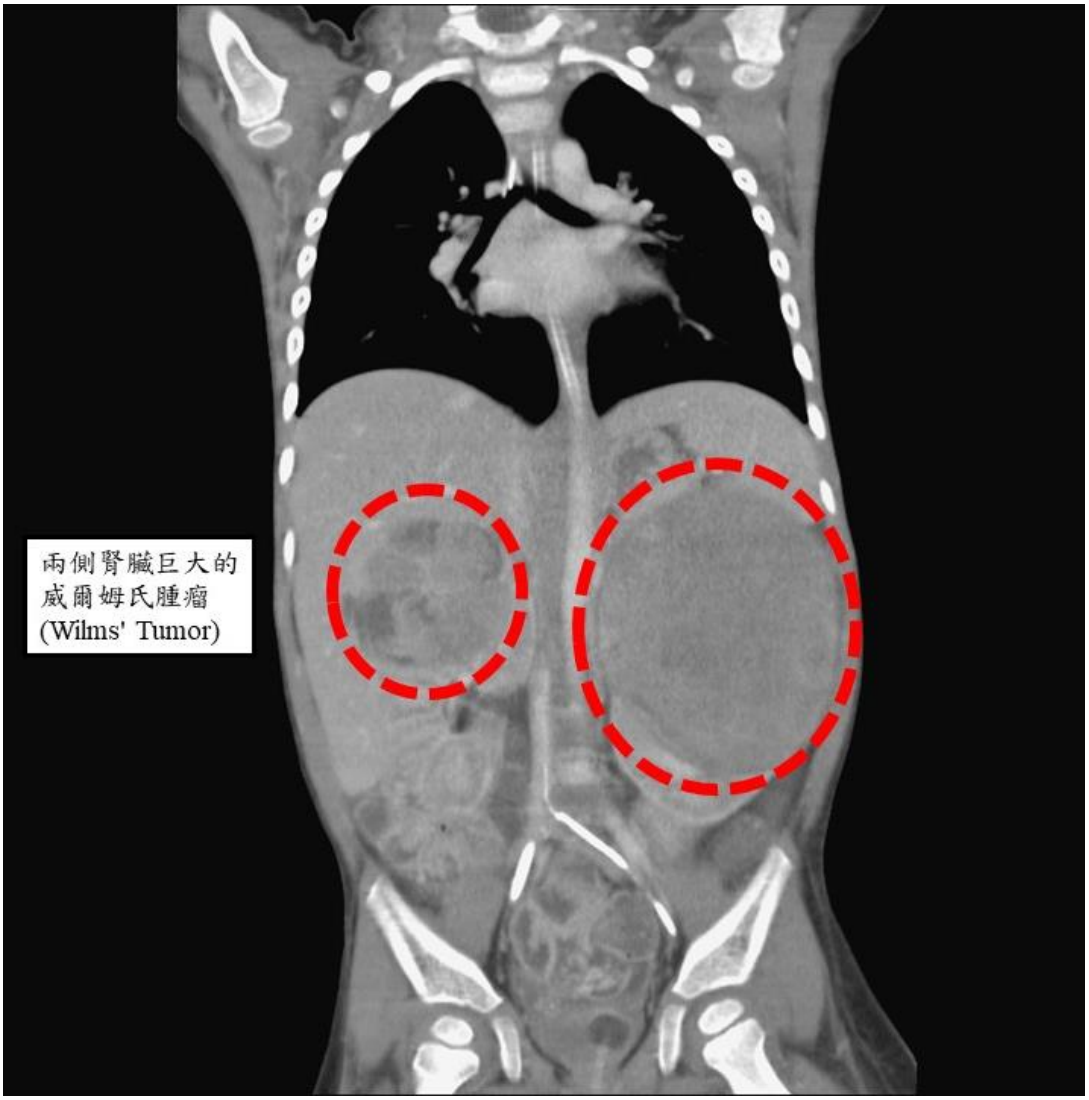

Figure 2 A large Wilms' tumor was found in both kidneys when the patient was 2.5 years old. Both kidneys had to be removed and chemotherapy was administered.

After 5 years of intensive chemotherapy and long-term follow-up, Wu's malignant kidney tumor was cured, but the side effects of dialysis continued and worsened. The medical team was at their wits' end, and a kidney transplant was the

only solution.

In May 2023, Wu's parents decided to travel from Pingtung to the Taipei Veterans General Hospital to wait for a kidney transplant. After a short two-month wait, she was fortunate enough to receive a posthumous kidney transplant. However, as a result of being compressed by a large Wilm's tumor as a child, her inferior vena cava had become fibrotic and even completely occluded (Figure 3), a very rare condition. With no vein to reconstruct, she had to forgo the possibility of a transplant.

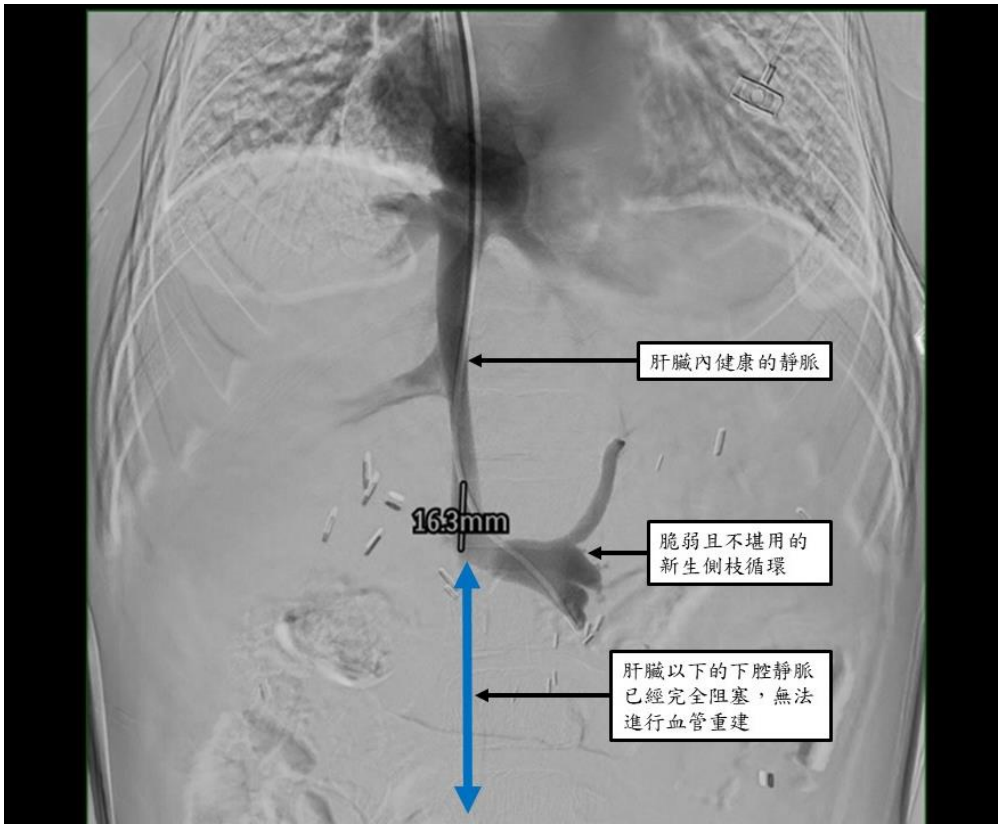

Figure 3 The only healthy functioning vein in the liver, others are completely blocked.

To give Wu a fighting chance, the kidney transplant team discovered through transcatheter venous angiography that only a small portion of Wu's intra-abdominal hepatic vein was healthy and functional, and the rest was useless collateral neovascularization. After careful consideration, the team decided that the only viable option was to split the liver and find the healthy vessel for reconstruction.

In April 2024, Wu was fortunate enough to receive a second posthumous kidney donation, and the transplant team decided to proceed with the transplant as previously hypothesized. The surgery involved overcoming intestinal adhesions caused by Wu's previous abdominal surgery and peritonitis, then completely dissecting the liver to find the only healthy hepatic vein. A graft extension was then created from the donor vein

and anastomosed to the renal vein in the kidney. An endovascular stent is immediately placed by the radiologist during the procedure to prevent the weight of the liver from compressing the venous flow back to the transplanted kidney and to maintain blood flow.

Although the patient experienced delayed graft function after the surgery, the new kidney gradually regained function with careful hydration control by Director Jei-Wen Chang of the Department of General Pediatrics, coupled with short-term hemodialysis treatment and immunosuppressive drugs.

Dr. Hsin-Lin Tsai, Director of the Department of Pediatric Surgery at Taipei Veterans General Hospital, said that kidney transplantation is the best treatment for children with end-stage renal disease. Patients not only have the best prognosis, but also can catch up with their peers in height, weight and even intellectual development after a successful transplant. It is very important to seize the golden window for transplantation.