

Successful transplantation to two recipients after splitting a large horseshoe kidney with complicated anatomy

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Because of the ongoing organ shortage, kidneys with atypical anatomy like horseshoe kidneys must be considered for transplantation [1,2].

A 44-year-old male (blood group B) with no history of kidney or urinary tract disorders (creatinine 0.5 mg/dl) was diagnosed as being brain dead after spontaneous subarachnoidal bleeding.

A horseshoe-shaped kidney was diagnosed intraoperatively, and after harvesting the liver and the pancreas nephrectomy of both kidneys together with the aorta and vena cava was performed by an external transplant team following a standard technique.

Before the organs were offered to our centre, they had not been accepted for transplantation by two major transplant centres because of suspected complex anatomy, large mass (estimated to be twice as large per side when compared with a normal adult kidney) and an enlarged isthmus.

After a long allocation process and time-consuming external cross match, inspection revealed a normal pancreas and the left kidney to have normal vascular anatomy, whereas the right kidney had one main with two accessory arteries and two separate veins. The isthmus contained normal kidney parenchyma. Injection of contrast medium into both ureters showed that each kidney had separate urinary-collecting systems.

The kidney was divided sharply followed by suture ligation of all vascular and tubular structures. The cut surfaces were then oversewn using interrupted sutures.

The left side of the kidney together with the pancreas-duodenal graft [cold ischemia time (CIT) 19 h] from the same donor was transplanted after 21 h CIT using a transperitoneal standard technique, namely to a 54-year-old woman with type I diabetes and renal failure requiring hemodialysis.

Initial function of both organs was normal with good diuresis and normal blood glucose levels. After one shot of antithymocyte globulin (7 mg/kg), immunosuppression was based on tacrolimus, mycophenolat mofetil and steroids.

Unfortunately, the completely normal functioning pancreas graft was lost in the third week after transplantation

because of duodenal perforation. Kidney function is normal to date (creatinine 0.5 mg/dl).

The right side of the kidney was successfully transplanted after 25 h CIT to a 44-year-old male on hemodialysis because of focal sclerosing glomerulonephritis. In a technically demanding and time-consuming back table procedure, the three arteries and the two veins were reconstructed – forming one common patch each. Reperfusion was excellent with immediate organ function. Immunosuppression consisted of tacrolimus, mycophenolate mofetil and steroids. Repeat postoperative sonography revealed no retroperitoneal collection [3]. The patient was discharged 2 weeks after operation with normal kidney function.

Horseshoe kidneys have an estimated incidence of 1:800 population and are frequently accompanied by vascular and urinary tract abnormalities [4–6].

Several cases of transplantation have been described, some transplanted split and some en bloc [1,7]. Even successful living donor transplantation of a horseshoe kidney was described recently [8].

Retrograde urography can show whether the kidney has separate urinary collecting systems. Otherwise, division can be technically demanding but not impossible.

Considering the shortage of organs available for transplantation, horseshoe kidneys should be routinely used for transplantation to two different recipients [1]. The organ size, complex vascular anatomy and the cut surface are not limiting factors for successful transplantation. The procuring surgeon has to be aware of the logistic and anatomic abnormalities. The splitting procedure and vascular reconstruction can be demanding and require an experienced transplant surgeon. Because of the fact that the splitting procedure is time-consuming, the kidneys should ideally be allocated and transplanted locally.

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