
Case Report

Transplantation of a Horseshoe Kidney

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Experience with horseshoe kidney transplantation is limited. Horseshoe kidney may be underutilized for transplantation because of the greater incidence of vascular and other associated urological anomalies. Nowadays, owing to a greater number of patients waiting for a kidney donation and to a shortage of organs donated, more suitable organ acceptance criteria have been formulated. The aim of this paper is to present the first Iranian experience with horseshoe kidney transplantation.

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Introduction

The continuing donor organ shortage has led to expansion of the criteria for acceptability of cadaveric organs, including those with anatomical variations. The horseshoe kidney is the most common anatomical variation of the kidney with an incidence of one in 400 people.¹ It occurs between the 4th and the 6th weeks of gestation and its incidence is twice as often in men.¹

Horseshoe kidneys display a great variation in origin, number, and size of renal arteries and veins.² This feature makes them technically more challenging for transplantation.

We report a case of cadaveric horseshoe kidney transplantation that, to the best of our knowledge, is the first presented case in Iran.

Case Report

A 32-year-old brain dead man, after falling down, was declared as an organ donor. Abdominal exploration for organ harvesting revealed that the

patient's kidneys were horseshoe type with good isthmusal parenchyma and two arteries associated with one vein and one ureter on each side without hydronephrosis or other renal abnormality. Inferior vena cava was in left side (Figure 1). So, it was harvested en bloc and on back table it was splitted into two kidneys by cutting of the isthmus. The edge of the isthmus was sutured watertight by 3-0 polydioxanone suture (Figure 2). Then, the two kidneys were transplanted to two patients separately (Figure 3).

After transplantation, one of the recipients developed adequate urine output and had uneventful postoperative course. The patient was

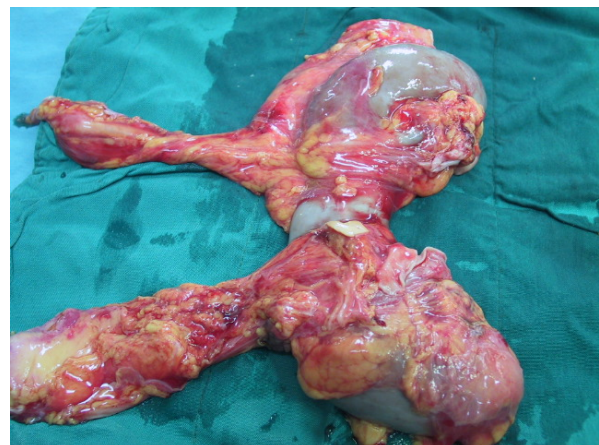


Figure 1. Horseshoe kidney after harvesting and on back table.

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Figure 2. Division of isthmus on back table and suturing the edge of the isthmus.

discharged from the ward, while he had normal creatinine.

The other recipient developed acute tubular necrosis. After conservative management and hemodialysis, her creatinine returned to normal range and she continued to do well at 12 months of follow-up.

Discussion

The first horseshoe kidney transplantation reported in the literature was performed by Nelson and Palmer in 1975.³

Because of the organ shortage, horseshoe kidneys are considered for transplantation. They can be transplanted en bloc or after dividing the isthmus. Making the decision to transplant a horseshoe kidney en bloc or split it depends on several factors such as the donor age, renal isthmus morphology, and vascular anatomy. To preserve multiple or anomalous renal vessels in cadaveric

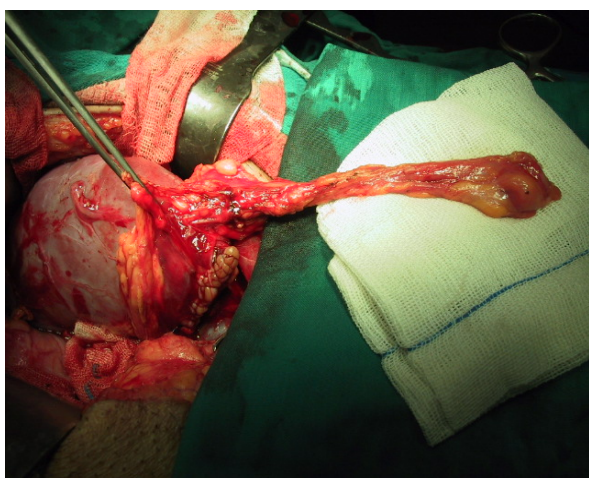


Figure 3. Right moiety of the horseshoe kidney after transplantation.

donors, removal of the horseshoe kidney should be always performed en bloc with a large segment of aorta and vena cava.⁴

Stroosma et al recommended a flow diagram for decision-making about performing en bloc or split transplantation of horseshoe kidneys.⁵ According to their diagram if the urinary collecting system crosses the midline, the horseshoe kidney should be transplanted en bloc. Whenever the urinary collecting system does not cross the midline, the renal vasculature should be closely inspected. If the number and position of the arteries and veins are deemed to cause a high risk of technical failure, the horseshoe kidney should be transplanted en bloc. If the risk of technical failure is thought to be low, the horseshoe kidney can be divided. In our case, the urinary collecting system did not cross the midline and the vasculature was suitable; therefore, we decided to split the horseshoe kidney and transplant it to two recipients.

To avoid postoperative hemorrhage from the parenchymal wound, cone-like excision of the isthmus is recommended so that the wound edge can be brought together.

In this survey, although one of the recipients developed acute tubular necrosis after transplantation, she improved with conservative management. Previous studies showed that the transplantation of horseshoe kidneys, either en bloc or split, yielded the same short-term as well as long-term results compared with the transplantation of kidneys with a normal anatomy.⁶ Hence, the concerns about horseshoe kidney transplantation are not justified; it must be noted that the transplantation of horseshoe kidneys remains technically challenging and should therefore be kept in experienced hands.

In conclusion, it should be mentioned that the horseshoe kidney can be an appropriate organ for transplantation if there are no significant pathologies and if meticulous attention is paid to technical details. We believe that because of the shortage of donors, horseshoe kidneys can and should be used as a safe source for organ donation.

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