



Division of the Horseshoe Kidney for Two Transplant Recipients: Review and Case Report

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Abstract

Horseshoe Kidney (HK) is the most common fusion anomaly of the renal system. According to the United Network of Organ Sharing (UNOS), over 100,000 patients in the United States require kidney transplantation with 66,000 patients currently on waiting list. Splitting the HK is another way to increase donor pool. This case report represents additional evidence of the successful division of a HK after procurement and successfully transplanted to two recipients. Division of the horseshoe kidney was made across the isthmus due to the low likelihood of involvement of the collecting system.

Introduction

Horseshoe Kidney's (HK) are the most common fusion anomaly of the renal system which occurs in approximately 1 in 500 individuals (1). Da Carpi originally described it in 1522, and many variants have been described since that time including deviations in renal position and vascular supply (2). Patients with HK's are often asymptomatic and are frequently discovered incidentally on imaging. Transplantation of HK for ESRD was reported initially in 1975 by Nelson, and the decision between en bloc or division of the HK varies (3). A literature review from the original case in 1975 to 2000 found 31 HKs transplanted to 48 recipients with ten transplanted en bloc and 21 divided

prior to transplantation (4). Our case represents additional evidence of the successful division of HK after procurement with renal transplantation to two recipients. Division of HK makes the possibility of two renal transplants a reality. According to UNOS.org, over 100,000 patients are in need of transplantation, with 66,000 patients currently on waitlists across the United States. In 2019, 23,401 renal transplants were performed (8). This demonstrates the tremendous need for donor organs in order to fulfill the demand. The incidence of HK is rare, but the splitting of HK is one way to increase transplantable kidney allografts.

Donor information: A 42-year-old with the horseshoe kidney (Figure 1, 2) organ procured as a donation after cardiac death (DCD).



Figure 1: Computed tomography images demonstrated (R), right kidney (L)left kidney (F) Image demonstrates fusion of the lower pole of the kidneys.

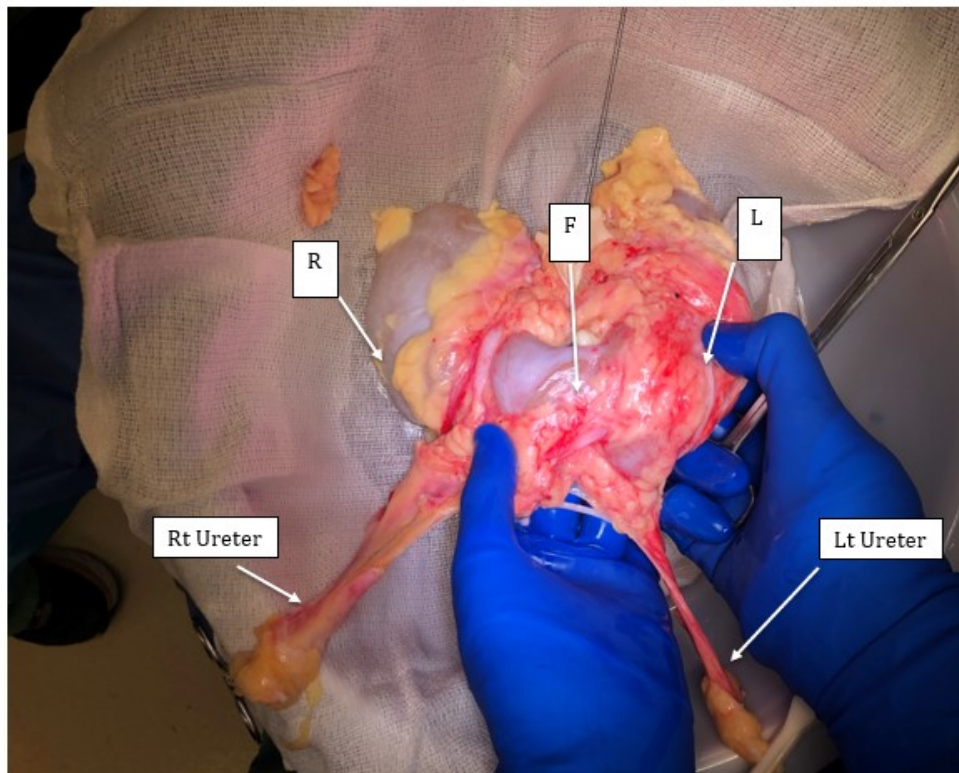


Figure 2: (R) Right kidney, (L) left kidney (F) fusion of the lower pole kidney

Case Report

Case number 1: A 67-year-old male with ESRD secondary to medullary cystic disease was listed for a deceased donor kidney transplant for three years and was on peritoneal dialysis. ABO and HLA compatible organ was becoming

available, and he was called in. His initial creatinine prior to kidney transplant was 12.68, postoperative day one dropped to 9.34, and postoperative day five on discharge further dropped to 3.12. He received the Right kidney.

Case number 2: A 63-year-old male with ESRD secondary to type 2 diabetes, and hypertension was on HD for more than two years while placed on the waiting list. ABO and HLA compatible organ became available and the patient was called in. his initial creatinine on arrival was 6.17, postoperative day one dropped to 5.29, and postoperative day five on discharge dropped to 2.9. He received the Left kidney

Discussion

This case report illustrates the complexity of renal transplant donors with variant renal anatomy. A horseshoe kidney is a rare finding in the general population but is not a contraindication for renal transplantation. There is the option for the surgeon to leave the horseshoe kidney intact and proceed with renal transplantation in one recipient or division of the kidney to allow for an additional patient to receive a kidney transplant. Many factors play a role in the decision for division, including the size of the horseshoe kidney, renal arterial and venous anatomy, and time from procurement.

Reviews of transplantation of horseshoe kidneys have been completed previously. One review evaluated 28 case reports, with 15 of these being completed en bloc and the remaining 13 resulting in a division of the horseshoe kidney and separate transplantation (5).

Procurement of horseshoe kidneys from deceased donors requires extreme precision to prevent damage to the associated anatomy, given the high likelihood of anatomical variants from arterial and venous perspective. It has been recommended that horseshoe kidneys be harvested en bloc and larger IVC segments and aorta be taken (6).

When consideration is given to the horseshoe kidney's division, it is recommended that division be made across the isthmus due to the low likelihood of involvement of the

collecting system and lower volume of tissue present in this area (7).

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