Living kidney donor with expanded criteria for qualification – a case report

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ABSTRACT

Kidney transplantation from a living donor is the best method of treatment of end-stage renal disease. The cost of treatment is lower than that of long-term dialysis. It allows for avoiding dialysis in patients referred for pre-emptive transplantation. It does not pose a threat to donor’s health, as documented by the long-term study results. In order to be qualified, the donor must be in full health. Kidney disease, cardiovascular, gastrointestinal, and respiratory disorders as well as viral infections must be excluded on the basis of clinical investigations, including laboratory testing and imaging studies.

A 59-year-old patient was admitted in order to be qualified for transplantation as a living kidney donor for his son. Significant abnormalities included the presence of hypertension resistant to treatment. Computed tomography revealed left renal artery stenosis, which was considered the etiology of resistant hypertension. During the left-side nephroureterectomy, after visualization of the left renal artery a tightly adhering atherosclerotic plaque penetrating into the aorta was identified. Follow-up after three months, eight months and three years showed reduction in blood pressure and no need for hypotensive medication. Apart from persistent hyperlipidemia, patient’s laboratory tests were unremarkable. The donor remained in good general condition, as did the kidney recipient. No significant deviations associated with the procedure were noted.
INTRODUCTION

Nowadays, kidney transplantation is the best way of treatment of end-stage renal failure (1). Results of transplantation of organs procured from living donors are much better in comparison to those from deceased donors (2). Benefits of living donation include not only better graft survival and reduced number of episodes of rejection, but also shorter dialysis time and greater chance for preemptive transplantation (meaning that the recipient remains in pre-dialyses period). Fewer rejection episodes imply the possibility of reducing immunosuppression and therefore, lower incidence of associated complications. Beside the obvious improvement in recipients’ quality of life, the possibility of pre-emptive transplantation significantly reduces the cost of end-stage renal disease treatment in relation to possible avoidance of renal replacement therapy by hemodialysis. In addition, scheduled and controlled character of the procedure improves its safety and reduces the relative length of hospital stay and absence from work due to illness.

Number of patients awaiting transplantation is significantly higher than that of available organs. Therefore, living donors remain an important source of organs widening the pool of transplanted kidneys. In Poland, the proportion of transplants from living donors is still very low compared to other countries. It remains on the level of 5%, while in the United States almost 50% of transplanted kidneys come from living donors. Kidney donation cannot lead to deterioration of donor’s health condition in the perioperative period as well as in a long-term perspective. For that reason restrictive, multi-stage system of living donor qualification was organized in Poland. This detailed and thorough process includes a wide panel of laboratory tests, imaging and a range of specialist consultations. In order to standardize the procedure, the 2005 Amsterdam Forum On the Care of Live Kidney Donor issued the exclusion criteria. These guidelines include conditions that may be associated with an increased risk of development of renal failure in the future. Likewise, they identify potential donors with mild abnormalities characterized by a relatively low risk that are considered acceptable, e.g. patients with mild, easily controlled hypertension.

CASE REPORT

A 59-year-old man (BMI = 25.3 kg/m²) with no previous history of chronic disease except for hypertension, reported to the transplant center as a potential kidney donor for his son. Blood tests revealed no significant abnormalities and the serum creatinine concentration was 1.0 mg/dL. Dynamic scintigraphy of the kidneys demonstrated total glomerular filtration rate (GFR) amounting to 88 mL/min and comparable function of both kidneys (GFR 40 mL/min for the right kidney and GFR 48 mL/min for the left one). A 24-hour blood pressure monitoring (ABPM) revealed abnormal blood pressure values reaching up to 160/100 mmHg, without reduction despite administration of antihypertensive drugs (ramipril, doxazosin). According to the criteria adopted by the panel of experts in Amsterdam, the patient should have been disqualified from donation, due to inadequately controlled hypertension (4, 5). However, unexplained etiology of the disorder and doubts with regard to regular use of medication resulted in a decision to expand the diagnostics. Multiphase CT scan of the abdomen revealed a short, segmental, critical stenosis of the periaortic part of the left renal artery (0.9 mm in diameter and 2.9 mm in length) with as light widening to 8 mm downstream of the stenosis. Renal venous system presented atypical course. Additional tests: Doppler ultrasonography of carotid arteries, angio-CT scan of coronary arteries and echocardiogram for assessment of left ventricular function did not show any pathologies. Consequently, stenosis of the left renal artery was recognized as the most probable cause of hypertension. Subsequently, the patient was referred for left-sided nephroureterectomy for donation by the decision of a specialist council. The procedure was performed in June 2011. During surgery the presence of an approximately 4-cm-long, hard atherosclerotic plug closely adhering to the aorta and penetrating into the artery lumen was revealed. Two vascular clips were placed on the artery beyond the atherosclerotic plug, where vessel walls were soft. The renal vein was dissected beyond the aorta. The procured organ was subsequently transplanted without any complications. Moreover, no complications were observed during donor’s postoperative hospitalization. The patient was discharged on the 5th postoperative day with serum creatinine concentration of 1.3 mg/dL, urea concentration of 24.0 mg/dL and microalbuminuria amounting to 8 mg/dL. Three months after surgery, during the follow-up examination, blood pressure was 120/75 mmHg without any hypotensive medication. Serum creatinine concentration was also within normal limits. Three years after the procedure, blood pressure was maintained within normal range, amounting to 140/70 mmHg, with stable serum creatinine concentrations. During the follow-up period the patient did not require administration of any hypotensive drugs. The recipient’s serum creatinine concentration was 1.4 mg/dL over the three-year post-transplantation period.

DISCUSSION

The Milan Criteria are strictly adhered to in Polish donation procedures. However, it must be remembered that nowadays some deviations from the general rules may be acceptable, for example when the patient uses a single hypotensive drug for good control of hypertension, or when nephrectomy could cause regression of the underlying disease - as in the presented case. In this case, the benefits of individualization of therapeutic action and expansion of diagnostics were mutual – donor’s hypertension...
subsided, while the recipient of the kidney was able to function without renal replacement therapy.

CONCLUSION

Performing additional diagnostic procedures resulted in a possibility of expanding the criteria for qualification to kidney donation and both the donor as well as the recipient benefited from that (6). Nephroureterectomy performed for donation eliminated the cause of donor’s renovascular hypertension and resulted in normalization of blood pressure without administration of any hypotensive medication. At the same time, kidney recipient was spared from renal replacement therapy, at least during the three-year observation period. The presented case shows that each patient should be treated individually. The risk associated with donation must be analyzed separately each time despite accepted procedure standards. In some special cases, extending the diagnostics beyond the routine framework may lead to acceptance for organ donation despite previous diagnosis of a condition considered an absolute contraindication (7).

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