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Case Report

Monoclonal gammopathy of undetermined significance: a contraindication for living kidney donation?

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Abstract
During the last few years, the number of living donor kidney transplants has increased and this form of transplantation is currently the only option in some patients. We report two cases of living donor kidney transplantation in which the donor carried monoclonal gammopathy of undetermined significance. Neither of the two receptors has developed complications at 42 and 36 months after transplantation, respectively, and the donors have normal renal function and there is no evidence of progression to multiple myeloma.

Keywords: living donor; monoclonal gammopathy

Background

Kidney transplantation is the most effective option in patients with chronic renal failure in terms of survival and quality of life [1]. However, during the last few years, waiting lists for this procedure have become longer due to the decrease in the number of brain-dead donors, among other factors. In this setting, living donor kidney transplantation (LDKT) plays a major role and represents the only real option for transplantation in some patients [2, 3]. Due to the growth of LDKT, new scenarios have been developed in which decisions on the feasibility of kidney transplantation can be difficult to make [4, 5].

In our institution, monoclonal gammopathy of undetermined significance (MGUS) was detected during investigation of two possible living donors, a condition potentially contraindicating donation. A review of the current literature was performed but, to date, publications on this topic are lacking. The Amsterdam criteria for living kidney donation also were reviewed but this matter is not considered.

After multidisciplinary evaluation, the donation was not contraindicated and two kidney transplantations from living donors with MGUS were performed. This article aims to present the results.

Case 1

The patient was a 62-year-old Caucasian woman without toxic habits. She was affected by chronic renal failure stage V secondary to renal polycystic disease under renal replacement therapy with hemodialysis. Other pathologic antecedents were hypertension, hypercholesterolaemia and breast carcinoma without recurrence in the 10 years prior to the pre-transplantation study. The patient had no contraindications for kidney transplantation.

A possible kidney living donor (husband) was studied. He was a 63-year-old Caucasian man and showed no contraindication for donation except for MGUS. The monoclonal protein was IgG lambda and the bone marrow examination showed 3% plasma cells. The M-protein concentration in the serum was 13.2 g/L and serum free light chains lambda and kappa were 18.50 and 21.20 mg/L, respectively, with a normal ratio.

Kidney transplantation was performed in December 2006 initially without incident. Induction immunosuppressive treatment consisted of basiliximab, mycophenolate mofetil, prednisone and tacrolimus. After 10 days, renal function deteriorated and severe hypertension developed. Ultrasound examination revealed significant elevation of renal artery velocity. Angiography showed critical stenosis of the renal artery and angioplasty with stent placement was performed. Renal function subsequently improved and the patient showed no further complications. At the time of writing, 42 months after kidney transplantation, serum creatinine is 1.2 mg/dL (106 μmol/L) and the 24-h urinary protein excretion is 140 mg.

Three months after the procedure, tacrolimus was switched to sirolimus due to the donor's age and to minimize the risk of malignancy. The patient is currently receiving sirolimus and mycophenolate mofetil.

To date, the patient has had no immunological or infectious complications. Serum protein electrophoresis and serum immunofixation have shown no monoclonal proteins.

The donor's renal function is currently normal, no complications have been detected and there is no evidence of MGUS progression.

Case 2

The patient was a 34-year-old Caucasian man, without toxic habits, with chronic renal failure stage V due to membranous glomerulonephritis but he had no other remarkable medical history. He was studied for receiving a preemptive kidney transplantation but there were no contraindications.

Study of a possible living donor (the patient's 71-year-old mother) was performed. No contraindications for donation were found but she carried an MGUS with two monoclonal proteins, IgG kappa and IgA lambda. A bone marrow examination showed 8% plasma cells. The M-protein concentration in the serum was 10 g/L and serum free light chains lambda and kappa were 14.4 and 16 mg/L, respectively, with a normal ratio.

Kidney transplantation was carried out in May 2007 with no complications and renal function progressively improved. The patient was discharged 1 week after the procedure. Currently, 36 months after the transplantation, the patient has a serum creatinine level of 1.8 mg/dL (159 μmol/L) and a 24-h urinary protein excretion of 200 mg.

Induction immunosuppressive treatment consisted of basiliximab, mycophenolate mofetil, prednisone and tacrolimus. Three months after transplantation, tacrolimus was switched to sirolimus for the same reasons as in Case 1. The patient is currently receiving sirolimus and mycophenolate mofetil.

The patient has developed no immunological or infectious complications and serum protein electrophoresis and serum immunofixation revealed no monoclonal proteins.

No complications have occurred in the donor and there is no evidence of MGUS progression. Renal function is normal.

Discussion

MGUS is a benign condition observed in 3% of Caucasians aged >50 years old and 5% of those aged >70 years old [6]. This entity consists of the presence of a serum monoclonal immunoglobulin, called M protein, with no evidence of malignant disease such as multiple myeloma (MM), macroglobulinemia, AL amyloidosis or other plasma-cell proliferative disease. The main concern of MGUS is the potential risk of progression to a malignant disease. This risk to evolve to MM is 1% per year and the main risk factor for progression is the serum M protein concentration. The risk of progression persists even after 25 years of follow-up [6–8].

MGUS in a living kidney donor could potentially lead to complications for both the donor and the recipient. For the donor, the main complication would be the progression of MGUS to MM, which could involve the kidney with risk of renal failure in a single kidney patient. For the recipient, the main complication would be transmission of MGUS through the transplant, leading to a risk of malignancy.

To date, neither of the two patients has developed complications at 42 and 36 months after transplantation, respectively. Both recipients have good renal function and have shown no graft rejection. Serum protein electrophoresis and serum immunofixation have shown no monoclonal proteins, indicating that MGUS transmission has not occurred. The donors have normal renal function and there is no evidence of progression to MM.

In our opinion, the appropriate immunosuppressive treatment in these patients is the use of mammalian target of rapamycin inhibitors to minimize the risk of malignancy [9] and to avoid the nephrotoxicity of calcineurin inhibitors in donors of advanced age [10].

In the foreseeable future, living kidney donation from donors with MGUS may no longer be exceptional due to the high incidence of MGUS, the increasing number of LDKT and the acceptance of greater age in donors and recipients. Due to the favorable results obtained in our two patients until now, we no longer consider MGUS in the donor as a contraindication for LDKT. However, protocols should be established to optimize the approach in this situation.

Conflict of interest statement. None declared.

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