

Improvement of Severe Heart Failure with Multivalvular Dysfunction after Kidney Transplantation

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Introduction

It is well documented that patients with renal failure suffer from some degree of cardiovascular illnesses.⁽¹⁾ In chronic uremia, cardiovascular disease manifests as concentric left ventricular hypertrophy, left ventricular dilatation, systolic dysfunction, or diastolic dysfunction.⁽²⁾ These conditions create a predisposition for developing heart failure, arrhythmias, and sudden death,⁽³⁾ which can be prevented with renal transplantation.^(4,5) We report 2 patients with end-stage renal disease (ESRD) and severe systolic dysfunction with multivalvular dysfunction whose cardiac indexes improved considerably after kidney transplantation.

Case Reports

Two girls (20 and 15 years old) with ESRD, the first due to an unknown etiology and the other due to a suicide attempt with nephrotoxic drugs, presented with severe dyspnea, high blood pressure, and anemia. Both had been on hemodialysis for about 2 years. On admission, because of massive pericardial effusion, pericardiotomy was performed for the first patient. Both patients were candidates for heart transplantation because of severe refractory congestive heart failure (CHF). Echocardiographic findings were left ventricular ejection fractions (LVEF) of 15% to 20%, mitral

regurgitation (MR), aortic insufficiency (AI), tricuspid regurgitation (TR), and severe cardiomegaly, for both of them. After medical management of CHF for 1 month, the best achieved LVEFs were 20% to 25%.

Both patients underwent kidney transplantation. The operations were successful with functional allografts. Three months after transplantations, patients' cardiovascular conditions were assessed. Both patients were asymptomatic, and echocardiographic findings were suggestive of a considerable increase in LVEF, improvement of MR, AI, and TR, and moderate cardiomegaly. Laboratory and echocardiographic findings before and after transplantation are presented in Table 1.

After 1 year's follow-up, both patients' LVEF values reached acceptable levels (about 65%), and their valvular disorders have improved considerably. There was no need for any medication other than maintenance immunosuppressive triple-therapy. Chest radiographs of the first patient, before and after surgery, are presented in Figures 1A and 1B.

Discussion

Kidney transplantation has a beneficial impact on the uremic patient's cardiomyopathy, whether it manifests as left ventricular hypertrophy, left ventricular dilatation, or systolic dysfunction.⁽²⁾ Left ventricular dilatation is significantly reduced following transplantation.^(2,4) Four types of valvular dysfunctions may be observed in patients with chronic renal failure: calcification due to polycystic kidney disease or secondary

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TABLE 1. Laboratory and echocardiographic findings before and after transplantation

		Hemoglobin	Blood pressure	EF	MR	AI	TR
Case 1 (20 years old)	Preoperative	7 mg/dL	180/90 mm Hg	20%	3+	3+	2+
	postoperative	-	-	50%	2+	1+	1+
Case 2 (15 years old)	Preoperative	6 mg/dL	180/100 mm Hg	25%	2+	1+	3+
	postoperative	-	-	50%	1+	1+	1+

EF: ejection fraction, MR: mitral regurgitation, AI: aortic insufficiency, TR: tricuspid regurgitation

hyperparathyroidism, dilated cardiomyopathy, primary valvular heart disease, and valvular diseases due to systemic disorders (anemia, overload, hyperadrenergism, and arteriovenous fistula). Only the first two groups need valve replacements.⁽⁶⁾

There have been reports on cardiovascular outcomes in CHF after kidney transplantation.^(4,5) Many researchers have studied the effects of kidney transplantation on heart pathology due to ESRD, but none of their cases had been with LVEFs below 50%.^(2,4,5) Although patients with lower ejection fractions have been reported,⁽⁷⁻⁹⁾ none of them demonstrated significant multivalvular dysfunction. It is known that some degree of left ventricular hypertrophy and probably heart failure improve after successful kidney transplantation.⁽²⁾ Both of our patients had severe CHF, with marked multivalvular dysfunction and neither responded to medical treatment. Some have used angiography to rule out coronary artery disease or cardiac biopsy.⁽¹⁰⁾ We did not do so, because no heart-related risk factors (other

than uremia) were present. Both of our patients were candidates for cardiac transplantation owing to severe heart failure.

In conclusion, patients with ESRD, heart failure, and multivalvular dysfunction, should not be offered early cardiac transplantation, even if cardiovascular complications are severe. Both overt heart failure and multivalvular dysfunction are reversible with kidney transplantation. Presence of multivalvular dysfunction seems not to be necessarily an alarmingly poor prognosis for cardiac outcome after kidney transplantation. Young patients with multivalvular dysfunction and with no primary cardiogenic dysfunction or risk factors of coronary artery disease are especially good candidates, even without invasive cardiac workup.

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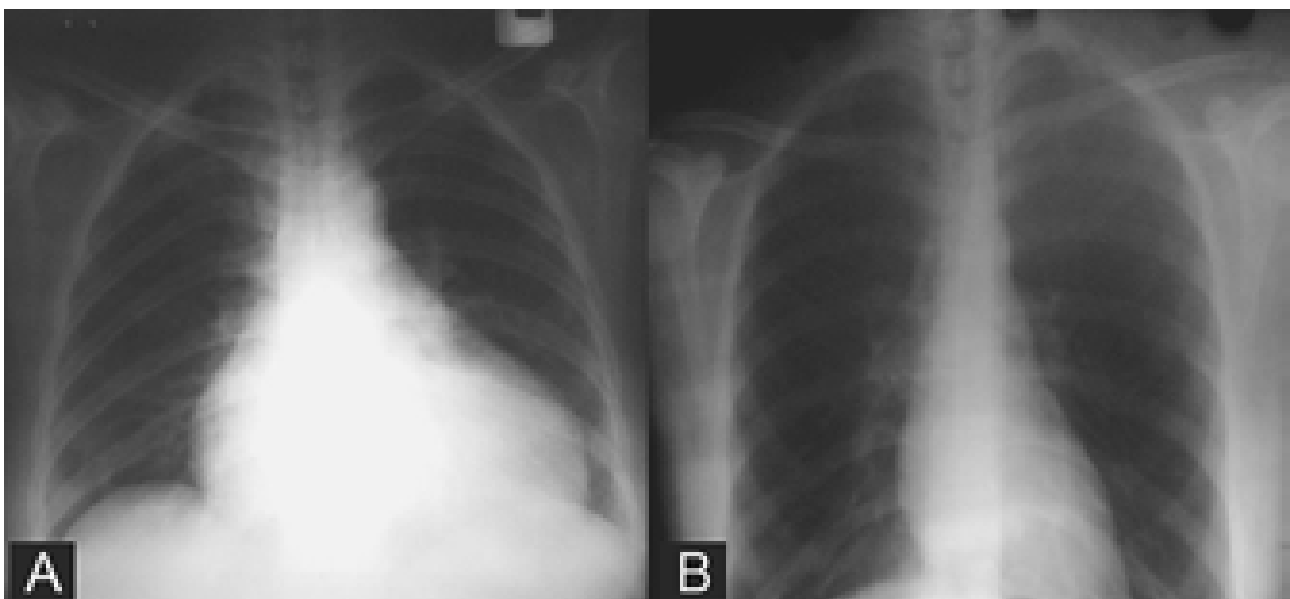


FIG. 1. A. Chest radiograph before transplantation, B. Chest radiograph 1 month after transplantation

- ventricular morphology and function, and 24-hour blood pressure profile. *Transplantation*. 2002;74:1580-7.
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