Case report

Simultaneous cardiac and renal transplantation late after hepatic transplantation

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Abstract

Multiple organ transplantation is rarely performed because the combination in a single patient of the clinical conditions with that indication is uncommon. Besides, the scarcity of organ donors dictates a policy of maximisation of the results. We present the case of a patient who previously had a liver transplantation and was subsequently submitted to a successful simultaneous cardiac and renal transplantation.

Keywords: Heart failure; Transplantation-heart; Multiple-organ transplantation; Organ donor management

1. Introduction

The number of patients with terminal cardiac insufficiency who have indication for cardiac transplantation is rising and demographic data show that these patients are increasingly more complex, presenting with dysfunction of other vital organs, whether or not the consequence of the cardiac dysfunction.

Often severe multi-organ dysfunction requires the transplantation of other organs besides the heart, but the low number of series of multi-organ transplantation, or case reports, in the international literature demonstrates the rarity of these cases. This may be a consequence of its technical/organisational complexity and of the low number of donors, justifying a policy of maximisation of the number of patients benefited.

2. Case report

We describe the case of a 61-year-old man, with a history of a neuroendocrine tumour of the pancreas, who was submitted to caudal pancreatectomy and splenectomy in September 1994. Because of metastatic hepatic disease, he was submitted to liver transplantation (domino-type, with a liver from a patient with familial amyloidosis) in June 1996, after multiple cytostatic treatments with no imagiological signs of remission.

The manifestations of cardiac insufficiency started in February 2005 and were thought to be the consequence of two types of cardiac injury: first, the last cycle of cytostatic medication, initiated in November 2004 after the diagnosis of a suspicious lesion in the caudal area of the pancreas, which resulted in an iatrogenic myocarditis that evolved to a dilated cardiomyopathy; second, the accumulation of amyloid material in the cardiac muscle that caused a restrictive cardiomyopathy, associated with ventricular dysrhythmias.

In March 2009, he was presented to the cardiac transplantation team, in class IV of the New York Heart Association (NYHA), having had multiple hospitalisations in intensive care units, complicated by renal insufficiency that, just as the cardiac insufficiency, is thought to be consequence of the two types of injury. The serum creatinine had initially risen to values of about 1.7 and 2.0 mg dl$^{-1}$, recently evolving to chronic renal insufficiency, with creatinine values between 4.0 and 5.0 mg dl$^{-1}$, aggravated by the intensive diuretic treatment, part of the relief therapy of the cardiac insufficiency.

Because of the deteriorating physical condition of the patient, with extremely poor quality of life, and a stable situation with regard to the malignant disease, he was accepted for transplantation, with a low-priority status conditioned to the availability of organs. The heart and kidney were harvested in May 2009 from a suitable 37-year-old isogroupal male donor, in our own hospital. The procedure was carried out sequentially during the same anaesthetic session: first, the heart using a bi-caval technique, then the kidney using the usual technique, with a total duration of approximately 4 h.

The postoperative period was uneventful, except for a period of urinary retention, which required re-insertion of the urinary catheter. The patient was discharged home on the...
16th postoperative day. No rejection episodes were detected, and the immunosuppressive medication scheme consists of tacrolimus, mycophenolate mofetil and steroids, which he was already receiving because of the previous liver transplantation.

The patient is well and in NYHA class I, 9 months later. The echocardiogram shows normal cardiac function (with a left ventricular ejection fraction (LVEF) of 72%) and the creatinine level has been normal (1.1 mg dl\(^{-1}\) in the last consultation). All myocardial biopsies were negative.

3. Discussion

As clinical transplantation is now being extended to procedures that may be viewed as directed towards improving the quality of life, rather than just survival, we thought it justified to exceptionally proceed to simultaneous cardiac and renal transplantation on a 61-year-old patient, who had a previous hepatic transplantation and a history of malignancy, which might not have not been completely eradicated.

Double, simultaneous heart—kidney or heart—liver transplantation is quite commonly performed [1]: kidney transplantation performed late after other solid-organ transplantation is also becoming increasingly frequent [2]; by contrast, although not unique, triple solid-organ transplantation (hepatic, renal and cardiac) is relatively infrequent because patients with clinical indications for each of these procedures are rare and usually are in very precarious condition, which would make this a technically demanding and hazardous procedure. In a review of current trends in multi-organ transplantation in the USA, Te and colleagues found only six cases of heart—liver—kidney transplantation reported to the UNOS database [3].

Besides, the scarcity of organs virtually mandates maximisation of the number of patients benefited. However, the liberal organ donation law in our country (presumed consent) results in a very short waiting list for heart transplantation, although the same does not apply to renal transplantation, because of added demand. This patient had been given a low priority for transplantation, eventually from a marginal donor, but he ended having an excellent donor. We perform 25–30 heart transplantations per year and our median waiting list was, at the time of this operation, less than 1 month. Hence, we usually only have three to five patients in the waiting list. At that particular time, none was more suited for that donor, neither locally nor in other departments in the country. Because of geographical constraints, only a few organs are exported to other countries.

On the other hand, in the few months prior to transplantation, the creatinine level had risen to 4–5 mg dl\(^{-1}\), which would inevitably result in a need for renal transplantation in the short term, if it had not been done simultaneous with the heart transplantation.

Indications for heart transplantation in amyloidosis are well established [4]. On the other hand, the history of malignancy could, in the opinion of some, constitute a contraindication for transplantation, but having in mind that the liver transplantation had already been performed for metastatic disease and that almost 15 years had passed since the malignancy was first diagnosed, the decision was thought to be scientifically and ethically justified. The excellent postoperative physical and functional recovery of the patient appears to vindicate this decision.

We are aware that the exceptional circumstances surrounding this patient may very rarely be reproduced, but we wish to leave a testimony of the endless options that may be used when treating these challenging patients.

References