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CASE REPORT

Use of Donor with Wolff-Parkinson-White Syndrome in Heart Transplantation: Report of Two Cases and Review of Literature

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Abstract: Donor shortage is a major limitation of heart transplantation. The use of high risk or marginal donors, donors with minor or correctable heart diseases are alternatives to face this problem. When identified in the evaluation, donors with Wolff-Parkinson-White syndrome (WPWS) are usually discarded for cardiac transplantation. In the literature, there are eight articles reporting single case of transplantation with donor with this syndrome. In this series, the management of recipient varied: clinical treatment, intraoperative donor heart anomalous band ablation and postoperative ablation. Results were good in all the eight cases. In the present article, we report two cases of cardiac transplantation with donors with WPWS, one treated clinically and the other one submitted to postoperative ablation. Based in the present experience and limited to eight reported cases, it seems that this type of donor heart can be successfully transplanted. It is controversial the management strategy for these patients. Careful evaluation of heart donor should be done regarding the presence of WPWS.

Descriptors: Heart transplantation; Tissue Donors; Wolff-Parkinson-White Syndrome.

INTRODUCTION

Heart transplantation is the accepted treatment for patients with end-stage heart failure. Donor heart shortage is one of the major limitations of this treatment modality, leading to high mortality in the waiting list. This way, the use of border line, so called marginal donors, and of hearts with some kind of disease is an alternative to increase the donor pool.

When Wolff-Parkinson-White syndrome (WPWS) is identified in a potential donor for heart transplantation, this donor is usually discarded for cardiac transplantation.

A few reports of single case heart transplantation with hearts with WPWS are found in the literature.[1-9]

CASE REPORTS

Case 1

A female patient, 44 years old, was admitted to the Heart Institute, Universidade de São Paulo, in congestive heart failure NYHA class IV. It was reported the presence of cardiac murmur since infancy. The echocardiogram has shown severe hypertrophic cardiomyopathy. The donor had encephalic death after head gun shot.

The electrocardiogram (ECG) showed short PR interval and delta wave (Fig. 1). The family reported that the patient had no arrhythmia, and, due to the clinical condition of recipient, the donor was accepted.

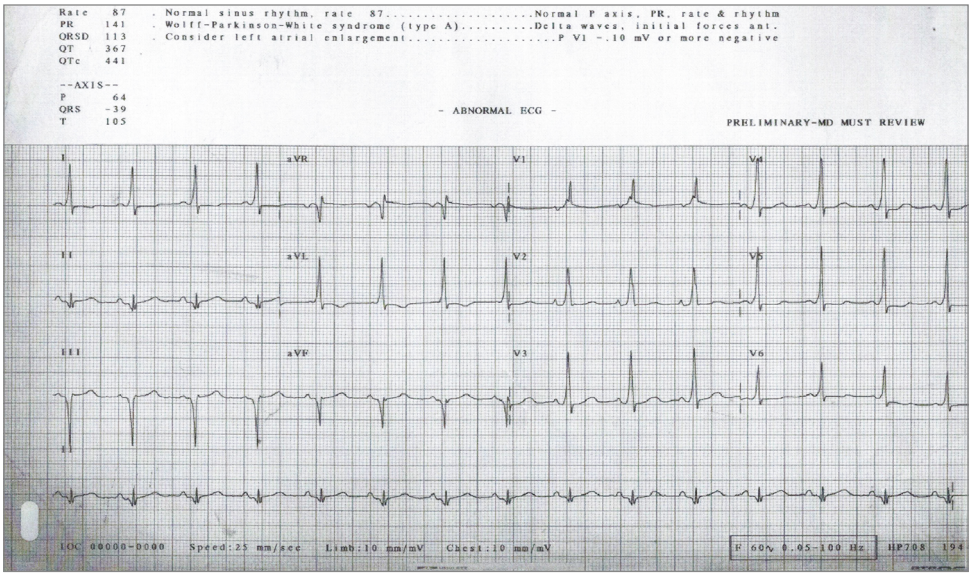

Figure 1. Electrocardiogram of case-1 patient showing short PR interval and delta wave.

Heart transplantation was performed by bicaval technique. The patient had an uneventful recovery. At the seventh postoperative day, the patient had pericardial effusion at echocardiogram and was submitted to pericardial drainage. Since then, the patient had good recovery with no tachycardia clinically and in 24 h dynamic electrocardiography. The echocardiogram was normal postoperatively.

In the fourth year of follow-up, the patient presented axillary ganglia. The biopsy diagnosis was Burkitt lymphoma. The doses of immunosuppressive drugs were decreased, and chemotherapy started with evidence of disease remission. Nevertheless, after four months, the patient was readmitted with nausea, vomit, and abdominal pain. The diagnosis of acute abdomen was stablished and rapidly evolved to septic shock and cardiac arrest.

The necropsy finding was perforation of the small bowel and Burkitt Lymphoma in the site of perforation at histology.

Case 2

A 39 year-old female patient in chronic atrial fibrillation and oral anticoagulation, congestive heart failure due to rheumatic valvulopathy was admitted in NYHA class IV.

A male donor, 28 years old, with cranioencephalic trauma as a consequence of fall. At the time of evaluation, ECG was considered normal. The donor was accepted for heart transplantation as the recipient remained in NYHA class IV. The echocardiogram was normal.

The transplantation was performed by bicaval technique. Furthermore, a DeVega annuloplasty was performed in the donor heart before implantation. Tricuspid annuloplasty to prevent late insufficiency was proposed in literature.

The postoperative ECG has shown a short PR interval and delta wave, but the patient had an uneventful recovery. Nevertheless, at the 13th postoperative day, the patient presented supraventricular tachycardia, heart frequency of 190 bpm, treated with bolus of amiodarona and maintenance dose. There were short periods of non-sustained tachycardia. The electrophysiologic study confirmed the diagnosis of WPWS with a left posteroseptal anomalous band. The ablation of this anomalous band was performed, and there was no clinical or electrographic evidence of pre-excitation syndrome in a 12-year follow-up.

DISCUSSION

Heart transplantation is the therapeutic alternative that improves life expectancy and quality of life of patients with refractory heart failure. One of its major limitations is the donor shortage, that leads to high mortality in the waiting list. Public and transplantation societies policies did not significantly improve this scenario. Several strategies to increase the heart donor pool have been proposed and results reported and discussed in consensus conferences.[10-13]

These include the use of high risk, or the called marginal donors, accepting older donors, donors with minor or correctable cardiopathy. Good or acceptable results have been reported.[10,12,13]

The WPWS has a reported incidence of 0,1 to 0,3% in population,[14] but it is considered higher as many patients are asymptomatic and ECG abnormalities are not so evident. The prevalence of tachycardia in WPWS patients vary from 12 to 80%, and this variation is probably due to patient selection bias.

In Table 1, there are nine articles of single case report of WPWS in transplanted donor heart.[1-9] One of these was about WPWS that appeared during a rejection episode and disappeared out after treatment – pre-transplantation ECG was normal.[3] In the other eight reported cases of literature, the age of donors varied from 19 to 34 years old, four were male, three female and one not reported. The ECG pre-transplantation was considered normal in two, and typical of WPWS in six. In this article, in one of the donors, the ECG was considered normal.

Table 1. Informations of publication of literature.

Authors	Donor age	Donor gender	ECG	Acessory pathway	Treatment	Follow-up
Thompson et al.,[1] 1989	23	F	WPW	Left lateral	Intraoperative ablation	Good- six months
Goy et al.,[2] 1989	19	M	NL	Left lateral	Clinical	Good- two months
Ollitrault et al.,[3] 1990	22	M	NL/WPW	Left lateral	Rejection treatment	Good- 24 months
Gallay et al.,[4] 1992	20	F	NL	Left lateral	Postoperative ablation	Good- four months
Rothman et al.,[5] 1994	34	F	WPW	Left lateral	Postoperative ablation	Good- 12 months
Blanche et al.,[6] 1995	20	M	WPW	Left post lateral	Intraoperative ablation Postoperative ablation (15d)	Good- 24 months
Kao et al.,[7] 2002	30	M	WPW	Left lateral	Postoperative ablation	Good
Conraads et al.,[8] 2005	21	M	WPW	Left lateral	Postoperative ablation (3W) Postoperative ablation (9W)	Good
Ceresnak et al.,[9] 2011	? Pediatric	?	WPW	Left lateral	Intraoperative ablation	Good- three months

ECG: electrocardiogram; F: female; M: male.

The management strategy varied in the eight cases: one was successfully treated clinically, three were submitted to intraoperative donor heart ablation, and in four the ablation was performed in different periods postoperatively and after electrophysiologic study. In all the eight cases, the accessory pathway was left sided lateral. In one of three cases of ECG WPWS pattern and were submitted to a second postoperative successful ablation. In all the eight patients, follow up showed no recurrence of WPWS or tachycardia.

About the patients reported in the present article, one was successfully treated clinically, and the other one was submitted to postoperative ablation due to repeated tachycardia. Both had left sided lateral anomalous bundle and have had an excellent follow-up from the point of view of arrhythmia.

CONCLUSIONS

Considering the eight cases of literature and the two reported in the present article, it seems that good results can be achieved in cardiac transplantation using WPWS donors.

It is controversial if ablation should be done in all the cases. It is also controversial, when ablation considered, if it should be done intraoperatively or postoperatively.

Careful evaluation of donor ECG should be done regarding the presence of WPWS and, if possible, inquire the family about the occurrence of arrhythmia in this particular donor. In presence of WPWS, an echocardiogram must be done to exclude other cardiac anomalies.

AUTHORS' CONTRIBUTIONS

Substantive scientific and intellectual contributions to the study: Stolf N; **Conception and design:** Stolf N; **Analysis and interpretation of data:** Bacal F; **Manuscript writing:** Stolf N & Honorato R; **Final approval:** Jatene F

DATA AVAILABILITY STATEMENT

Not applicable.

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