Indian Journal of
Extra Corporeal Technology

Case Report

Median Term Biventricular Assist as Bridge to Heart Transplantation

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Abstract

In India there is huge mismatch between organ donor and recipient, this mismatch resulting in loss of lives, Source- India today 02 November 2016. Bi ventricular assists are beneficial for such patients to live their routine life as they await heart transplantation. We present case of 64 year old man who came to our hospital with alcoholic dilated cardiomyopathy and deteriorated further while waiting for an organ.

The Bi ventricular assist device initiation and its management for 37 days of support will be discussed.

Keywords

Heartfailure, Shortage of organ donations, Bi-Ventricular assist devices as Bridge to heart transplantation, management and hearttransplantation

Introduction

We present a case of end stage alcoholic cardiomyopathy causing bi-ventricular dysfunction patient who was bridged to transplant using a Bi-ventricular assist device (Centrimag) for 37 days before proceeding with heart transplant.

We were able to employ Biventricular assist device until a donor heart was available and went on to perform a heart transplant successfully thereafter.

Case History

A 64 year old gentleman suffering from dilatedcardiomyopathy for the past 2 years was referred to our hospital. On pre-operative evaluation, the patient had severe biventricular dysfunction with an EF of 20%. Despite diuretics and Inotropic supports his condition deteriorated with decreased urine output, increased pedal edema and increased requirement of inotropic support.

Team meeting was called and decided to put the patient on Bi-ventricular assist until a donor was available for heart transplant.

Patient was shifted to Operation theatre, cannulated right atrium with 34Fr Straight venous cannula and 21Fr Biomedicus Straight (femoral) arterial cannula was used on proximal ascending aorta and went on regular cardio-pulmonary bypass, later pulmonary arterywas cannulated with 21Fr Biomedicus Straight (femoral) arterial cannula and Right superior pulmonary vein with a 32 Fr long bent venous cannulaand kept it clamped. Later we came off bypass and connected to the Bi-VAD circuit to initiate support. A Centrimag pump was used in both the circuits to maintain the flow.

Parameters	Pre Bi-VAD	Post Bi-VAD
Blood pressure	79/59mmHg(On ADR/DOPA/NORAD/MILRI)	112/68mmHg (All Inotropes tappered off after 48 hours)
CVP	21mmHg	06mmHg
SPO2	91% on O_2@15L/min	99%onO_2@2L/min (Extubated after 24 hours)
Lactate	5.3mmol/L	POD0 – 2.1mmol/L, POD1– 1.6mmol/L,
Creatinine/ Urea	2.0mg/dl/110mg/dl	0.6mg/dl/32mg/dl
Total Billirubin	2.39mg/dl	0.96mg/dl
Urine output(24 hours)	450ml	3160ml

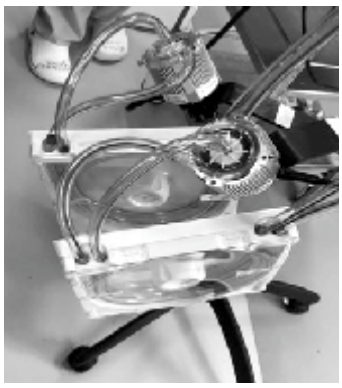
Postoperative care

Following Bi-VAD insertion, Patient was shifted to ICU with minimal inotropic support. Systemic arterial pressure approximately 90/70 with a mean of 70-80 mmHg, Pump flow: 4–5 LPM with Pump speed: 3000–4000 RPMRAP andLAP: 06-08 mmHg, ACT within normal range.Anticoagulation therapy was started after 6 to 12 hours after initiation of support tominimizeusual postoperative bleeding.

Anti-coagulation Management:

	ACT/INR	Platelets	Heparin	Aspirin	Acitrom
First 6-12 hours	215sec/1.9	195000cells/mm3	NIL	NIL	NIL
12-48 hours	178sec/-	180000cells/mm3	0.1ml/hr(25000IU in 50ml)	NIL	NIL
48-72 hours	165sec/1.43	99400cells/mm3	0.4ml/hr(25000IU in 50ml)	75mg	2mg
After 72 hours	-/2.31	157000cells/mm3	NIL	75mg	2mg

After 72 hoursof Bi-VAD Patient continues with oral anti-coagulants. Anticoagulants dose given according to INR.




Patient was maintaining all other vital parameters, was extubated on 2nd post-operative day.

Platelets count was improving requiring no blood products transfusion; hence he was started on oral anticoagulation on 4th post operative day.

Patient was shifted to ward with Bi-VAD support on 6th post-operative day. Round the clock pump flows were monitored. Cannula site sterile dressing was done on

regular interval to avoid any infections. At the same time patient was actively involved in physical activities (sitting, walking, cycling,).

After 37 days on Bi-VAD donor heart was available for Transplantation. Patient was shifted to Operation Theater with Bi-VAD and Intubated.Primed CPB circuit on table and divided to go on regular cardiopulmonary bypass.Target should be careful interchanging the lines without interrupting Bi- VAD flow Switch to RA and Aorta with CPB circuit by clamping and interchanging the lines. Cannulate SVC and IVC to go on Bi-Caval venous drainage. Remove RA,PA& LA cannulas to go ahead with explantation of native hear. Continue with same Aortic cannula to complete whole procedure. Patient subsequently underwent successful heart transplant. Total Ischemic time of 307minutes, cold ischemia-204 minutes, warm ischemia- 103 minutes. After 37 days on Bi-VAD, after transplant he was discharged within 2 weeks of his transplant.

He was followed up in OPD for one month and then he was sent back to his country in November 2017.

He came for review in January 2018. All necessary investigations done including Endo-myocardial biopsy was done which showed no evidence of cellular or antibody-mediated rejection.

He was advised a follow up in June 2018. He visited us in June, 2018. He is doing well. Again cardiac biopsy revealed no evidence of cellular or antibody-mediated rejection.

Discussion

Nearly 50,000 heart patients require transplant every year. But just about 350 transplants were conducted in the last 24 years, Sources- Mohan Foundation Statistics. But the demand and donor ratio is far too skewed.

In this scenario, Ventricular assist device is a very wise decision to go with. BiVAD support can effectively be used as a bridge to heart transplantation and can be accomplished with low mortality and morbidity. For severely ill patients, the overall survival rate on device was 90%.

In future the number of heart failure patients is going to increase with current lifestyle what majority of our population is living. And getting a suitable donor heart will be difficult or almost nil. Future of Bi-VAD is seen there as bridging these patients to transplant till they get a suitable heart.

More experience with VADs will help professionals to meet future demands.

Conclusion

Acute shortage of organs resulting loss of lives. In future Bi-VAD's would be lifesaving technique to reduce mortality rate caused by acute heart failure.Perfusionist play vital role in Bi-VAD support during waiting period to provide end organ perfusion and maintenance of biochemical parameters. Patients who go through bridgeto transplants require living their routine lives as they await heart transplantation. Whilebridging aiming at normal physiology and should be doing activities of daily living till they get donor heart would be optimal.

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