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Objectives

Treatment of patients with acute myocardial infarction and cardiogenic shock is complicated. In severe cases where medicine alone does not stabilize patients, the role of mechanical circulatory support is greatly considered. Over the past 10-20 years there has been a dramatic increase for patients with acute myocardial infarction (AMI) and cardiogenic shock to receive temporary assist device therapy. We analyzed our ten-year experience with CentriMag (St. Jude Medical Inc., St. Paul, Minnesota) ventricular assist devices (VAD) into patients to treat AMI and cardiogenic shock.

Methods

We retrospectively analyzed 68 patients who received a CentriMag VAD for AMI cardiogenic shock between January 2007 and December 2016 at our center. Early and late outcomes, including mortality, myocardial recovery, and bridge to other device or transplantation were analyzed.

Results

The mean age for the cohort was 58.5 ± 8.6 years and 48 (70.6%) of the patients were male. The median baseline ejection fraction was 18% (IQR, 13-23). The median duration of support was 22 days (IQR, 12-36). Fifty-five (81%) patients had at least one stent placed to treat AMI; the average number of stents placed was 3. Prior to CentriMag VAD insertion, 31 (45.6%) were placed on extracorporeal membrane oxygenation (ECMO), and 22 (32.4%) received concomitant Impella support. Types of CentriMag support included biventricular VAD (BiVAD) in 49 (72%) patients, minimally invasive VAD in 12 (18%) patients, right VAD in 5 (7.4) patients, and left VAD in 2 (2.9%) patients. Thirteen (19.1%) died while on CentriMag VAD. Twenty-six (38.2%) patients exhibited myocardial recovery, 20 (29.4%) patients were transitioned to a long-term durable VAD, 4 (5.9%) received an orthotopic heart transplant. The 30-day and in-hospital mortality were 22 and 34%, respectively. Kaplan-Meier curve analysis showed survival at 1 and 5 years was 59 and 49%, respectively. Within the past 5 years, 1-year survival improved from 48% to 64% (p=0.19) although the difference did not reach statistical significance.

Intraop Variables	CM patients
No. Arteries Stented	2.7 ± 1.4
Flow, mean ± SD	5.6 ± 0.8
Cardiopulmonary Bypass	
No. patients (%)	40 (58.8)
Time, min	105.9 ± 51.3
Open Chest	23 (33.8)
Intraop PRBC, units	3.6 ± 3.4
Intraop FFP, units	3.7 ± 3.4
Intraop Platelets, units	13.0 ± 9.3

Destination	CM Patients (%)
Survival to Discharge	45 (66.2)
Myocardial Recovery	26 (38.2)
Transition to VAD	28 (41.2)
OHT	4 (5.9)
Other	5 (7.4)
Death on CM	13 (19.1)

Conclusions

- Our data suggested that the treatment of acute myocardial infarction cardiogenic has improved over a 10 year period.
- Mechanical circulatory support in this cohort is appropriate.

Pre-Operative Variables	CM Patients (n=68)
Age at listing, years	
Mean ± SD	58.5 ± 8.6
Median (IQR)	59 (53-65)
Female	20 (29.4)
BMI, mean ± SD	28.3 ± 5.5
BSA, mean ± SD	2.0 ± 0.2
Co-morbidities	
CAD	52 (76.5)
HLD	32 (47.1)
DM	30 (44.1)
HTN	35 (51.5)
COPD	0
Prior CVA	2 (2.9)
Prior MI	31 (35.6)
Concomitant MCS	
Impella	22 (32.4)
IABP	39 (57.4)
ECMO	31 (45.6)
Percutaneous	35 (51.5)

4-year Survival Period of Subgroups Based on Era of CentriMag Implementation

