What's New in MCS

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Reviews:

Concomitant mitral valve procedures in patients undergoing implantation of continuous-flow left ventricular assist devices: An INTERMACS database analysis

Robertson JO, Naftel DC, Myers SL, Tedford RJ, Joseph SM, Kirklin JK, Silvestry SC
J Heart Lung Transplant. 2018 Jan;37(1):79-88
http://www.jhltonline.org/article/S1053-2498(17)32031-4/fulltext

The optimal management of mitral valve (MV) pathology in patients undergoing left ventricular assist device (LVAD) implantation remains controversial. Even though MV regurgitation and/or stenosis can adversely affect LVAD function, to date there are no standardized guidelines on how to best approach these complex pathologies in the LVAD population. There is also limited good quality data in regards to the short or long term outcomes for simultaneous mitral surgery and LVAD implantation. In this study, the authors used data from the INTERMACS database between April 2008 to March 2014 to compare outcomes between different types of MV procedures (MVPs) versus managing mitral regurgitation (MR) with LVAD implantation alone.

Patients who underwent MVPs spent an average of 24.3 mins more on cardiopulmonary bypass, 1 day less in the ICU and 1 day more in the hospital. They also had worse pre-operative hemodynamics remarkable for higher pulmonary vascular resistance (3.6 ± 2.9 vs 2.9 ± 2.6 Wood units; $p = 0.0006$) and higher pulmonary artery systolic pressures (55.1 ± 13.8 vs 51.5 ± 14.0 mm Hg; $p = 0.0003$). Early survival at 30 days post-operatively and survival at 2 years ($p = 0.15$) was not statistically significant in the different groups. However, there was a trend towards long-term survival advantage when destination therapy (DT) patients with moderate-severe MR underwent a MVP ($p = 0.0891$). Importantly, patients undergoing concomitant MV repair had significantly higher freedom from re-hospitalization at 1 and 2 years when compared to patients with no MVP and to those who received MV replacement ($p < 0.0001$). In regards to functional status, Six-minute walk distances were significantly increased at 1 year post-operatively for all groups, and no differences were noted at this point between groups. Also, the visual analog scale component of the EQ-5D-3L instrument did showed a significant difference at 1 year on patients who underwent MVP who reported overall better health.

This study demonstrates that undergoing MVP does not improve mortality in patients with mitral valve pathology undergoing LVAD implantation. However, MVPs are associated with a trend towards increased long-term survival in patients receiving an LVAD for DT. Concomitant MVPs may have benefits in terms of improving quality of life and reducing hospital admissions. When contemplating MVPs one has to reflect on the patient's clinical condition, goal of therapy (DT vs BTT) current hemodynamics and the VAD center and surgeon experience.

Acute kidney injury and 1-year mortality after left ventricular assist device implantation

Muslem R, Caliskan K, Akin S, Sharma K, Gilotra NA, Constantinescu AA, Houston B, Whitman G, Tedford RJ, Hesselink DA, Bogers JJC, Russell SD, Manintveld OC
J Heart Lung Transplant. 2018 Jan;37(1):116-123
http://www.jhltonline.org/article/S1053-2498(17)32100-9/fulltext

LVADs are used increasingly in patients with advanced heart failure that do not respond to optimal medical therapy. Many of these patients have end-organ dysfunction which includes chronic kidney disease. Among hospitalized patients with acute decompensated heart failure, acute kidney injury (AKI) is observed in > 50% of the patients and in >70% of patients diagnosed with cardiogenic shock. Data on the consequences of AKI after continuous flow left ventricular assist device (CF-LVAD) implantation has been inconsistent with reported incidence varying from 10 to 45%. In this study, the authors sought to evaluate the early post-implantation incidence of AKI, corresponding risk factors and its impact on mortality and renal function during the first year after CF-LVAD implantation.

In this study, the authors evaluated retrospectively the incidence of AKI and mortality in all patients undergoing CF-LVAD implantation in 2 participating centers from 2004 to 2015. Overall, 241 patients (76% males) were included in the study. The AKI criteria used was the definition proposed by the Kidney Disease Improving Global Outcome (KDIGO). AKI criteria were met in 70% of the patients and 45%, 9% and 16% were stage I, II and III respectively. In the multivariable analysis, two factors were independently associated with the development of AKI and its severity: 1) pre-operative use of inotropic support and 2) pre-existent chronic kidney disease with estimated glomerular filtration rate (eGFR) < 30 ml/min/1.73m2 (stage ≤ II). One-year mortality rates in patients without AKI and AKI Stages I, II and III were 18.7%, 26.4%, 23%, and 51%, respectively (log rank, p = 0.001). In the multivariable analysis, AKI Stage ≥ II was independently associated with mortality (hazard ratio 2.2 [95% confidence interval 1.1 to 4.5], p 1= 0.027) and worse renal function (β = –7.4 [95% confidence interval –12.6 to –2.1], p < 0.01) at 1 year.

This may be the largest series to evaluate the incidence and impact of AKI after CF-LVAD implantation. Unfortunately, AKI is a frequent complication after CF-LVAD implantation and this has been demonstrated again in this multicenter study. Furthermore, AKI has significant consequences to patients supported with CF-LVADs. This study showed that AKI is a strong prognostic indicator for mortality and poor renal function 1-year after CF-LVAD implantation. As noted by the authors, our efforts should focus on preventing or mitigating AKI as a major peri-operative goal.

Journal of Heart and Lung Transplant

The first-in-human experience with a minimally invasive, ambulatory, counterpulsation heart assist system for advanced congestive heart failure
J Heart Lung Transplant. 2018 Jan;37(1):1-6
http://www.jhltonline.org/article/S1053-2498(17)32077-6/fulltext

Impact of age, sex, therapeutic intent, race and severity of advanced heart failure on short-term principal outcomes in the MOMENTUM 3 trial
J Heart Lung Transplant. 2018 Jan;37(1):7-14
http://www.jhltonline.org/article/S1053-2498(17)32092-2/fulltext

Quality of life and functional capacity outcomes in the MOMENTUM 3 trial at 6 months: A call for new metrics for left ventricular assist device patients
J Heart Lung Transplant. 2018 Jan;37(1):15-24
http://www.jhltonline.org/article/S1053-2498(17)32085-5/fulltext

Early intervention for lactate dehydrogenase elevation improves clinical outcomes in patients with the HeartMate II left ventricular assist device: Insights from the PREVENT study
J Heart Lung Transplant. 2018 Jan;37(1):25-32
http://www.jhltonline.org/article/S1053-2498(17)32083-1/fulltext

Gender differences and outcomes in left ventricular assist device support: The European Registry for Patients with Mechanical Circulatory Support
J Heart Lung Transplant. 2018 Jan;37(1):61-70
http://www.jhltonline.org/article/S1053-2498(17)31882-X/fulltext

The Jarvik 2000 left ventricular assist device as a bridge to transplantation: Japanese Registry for Mechanically Assisted Circulatory Support
J Heart Lung Transplant. 2018 Jan;37(1):71-78
http://www.jhltonline.org/article/S1053-2498(17)32082-X/fulltext

Outcomes following implantation of mechanical circulatory support in adults with congenital heart disease: An analysis of the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS)
J Heart Lung Transplant. 2018 Jan;37(1):89-99
http://www.jhltonline.org/article/S1053-2498(17)31682-0/fulltext

Use of a percutaneous temporary circulatory support device as a bridge to decision during acute decompensation of advanced heart failure
J Heart Lung Transplant. 2018 Jan;37(1):100-106
http://www.jhltonline.org/article/S1053-2498(17)32035-1/fulltext

Pre-operative proteinuria in left ventricular assist devices and clinical outcome
J Heart Lung Transplant. 2018 Jan;37(1):124-130
http://www.jhltonline.org/article/S1053-2498(17)31902-2/fulltext

A roadmap for evaluating the use and value of durable ventricular assist device therapy
J Heart Lung Transplant. 2018 Jan;37(1):146-150
http://www.jhltonline.org/article/S1053-2498(17)31873-9/fulltext

Journal of Cardiac Surgery

Successful use of extracorporeal membrane oxygenation support in severe septic shock with associated acute cardiomyopathy
J Card Surg. 2018 Jan;33(1):50-52
http://onlinelibrary.wiley.com/doi/10.1111/jocs.13508/epdf

Annals of thoracic Surgery

Abciximab/Heparin Therapy for Left Ventricular Assist Device Implantation in Patients With Heparin-Induced Thrombocytopenia
Ann Thorac Surg. 2018 Jan;105(1):122-128
http://www.annalsthoracicsurgery.org/article/S0003-4975(17)30911-6/fulltext

Circulation

No mechanical circulatory support articles in January 2018.

European Heart Journal

No mechanical circulatory support articles in January 2018.

Journal of American College of Cardiology – Heart Failure

No mechanical circulatory support articles in January 2018.