

What's New in MCS

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ARTICLES:

Journal of Thoracic and Cardiovascular Surgery



John R, et al. [Impact of Concurrent Surgical Valve Procedures in Patients Receiving Continuous-Flow Devices. J Thorac Cardiovasc Surg. 2014 Feb; 147\(2\):581-89.](#)

Mascio CE, et al. [Perioperative Mechanical Circulatory Support in Children: An Analysis of the Society of Thoracic Surgeons Congenital Heart Surgery Database. J Thorac Cardiovasc Surg. 2014 Feb; 147\(2\): 658-665.](#)

Weinstein S, et al. [The Use of the Berlin Heart EXCOR in Patients with Functional Single Ventricle. J Thorac Cardiovasc Surg. 2014 Feb; 147\(2\): 697-705.](#)

Journal American College Cardiology

Ghosh N, et al. [Multimodality Imaging for the Assessment of Total Artificial Heart Function. J Am Coll Cardiol. 2014; 63\(4\) e7-e7.](#)

Circulation: Heart Failure

None

Journal of Cardiac Failure



Schlendorf K, et al. [Thrombolytic Therapy for Thrombosis of Continuous Flow Ventricular Assist Devices. J Card Fail. 2014; 20\(2\):91-7.](#)

European Journal of Heart Failure

None

REVIEWS:

John R, et al. *Impact of Concurrent Surgical Valve Procedures in Patients Receiving Continuous-Flow Devices. J Thorac Cardiovasc Surg. 2014 Feb; 147(2):581-89.*

This retrospective analysis set to examine the outcomes of patients receiving Heartmate II LVAD with and without concurrent valve procedures. Between May 2005 and January 2010, 1,106 patients were enrolled in Heartmate II clinical trials, of which 470 were implanted as bridge to transplant and 636 as destination therapy.

Concurrent procedures were performed in 465 of 1106 total procedures (42%), but of these, only 242 (21%) were valve procedures. The majority of the valve procedures were isolated tricuspid (n=124), followed by aortic (n=55), mitral (n=26) respectively. Multiple valve procedures were performed in 37 patients, of which 32 included tricuspid intervention.

Patients who received valve procedures were significantly older, had higher central venous pressure, decreased right ventricular stroke work index, and higher pre-operative blood urea nitrogen levels. They also had higher cardio-pulmonary bypass times. Patients receiving only Heartmate II LVAD had more pre-operative inotrope use.

Unadjusted 30 day mortality was significantly higher in patients who concomitantly received Heartmate II LVAD with valve procedures (10.3% vs 4.8%; p=0.005). Patients with two or more valve procedures also had a significant increase in mortality (n=5 [13.5%]; p<0.05) in subgroup analysis. Additionally, at 180 days, patients receiving isolated aortic procedures had a significantly higher mortality (n=16 [29.1%]; p<0.05). Patients with valve procedures were also more likely to require RVAD support (n=22, [9.1%]; p<0.001).

Though there was a trend towards increased mortality with isolated mitral (11.5%), aortic (10.9%), and tricuspid (8.9%) valve procedures, none reached statistical significance.

This manuscript shows that patients who require concomitant valve procedures at the time of Heartmate II implantation are sicker and have higher early mortality and right ventricular dysfunction. Patients who require multiple valve procedures have increased short and long term mortality. However, isolated tricuspid and mitral procedures, in this retrospective analysis, did not show a statistically significant increase in mortality at 30 or 180 days. Further criteria to discern which procedures are most appropriate for a given patient at the time of Heartmate II implantation are needed.

Schlendorf K, et al. *Thrombolytic Therapy for Thrombosis of Continuous Flow Ventricular Assist Devices*. J Card Fail. 2014; 20(2):91-7.

This 8 patient single center case series examined patients supported with Heartmate II LVAD between September 2011 and May 2012. All patients had refractory intravascular hemolysis (as diagnosed by elevated plasma free hemoglobin and lactate dehydrogenase) as a result of pump thrombosis. Consideration for thrombolytic therapy was only considered after patients had failed less aggressive approaches, including systemic unfractionated heparin, higher target INR, increased anti-platelet therapy, use of GPIIb/IIIa inhibitors and intravenous direct thrombin inhibitors.

Once patients were considered candidates for tPA (no prior intracranial hemorrhage, stroke, head trauma or active internal bleeding), the drug was administered intra-cardiac via a pigtail catheter, retrograde through the aortic valve at the level of the LVAD inflow cannula. Alteplase was given at a rate of 1mg/min over 30-50 minutes alongside unfractionated heparin with an activated clotting time > 200 seconds.

Of the 8 patients who received intra-cardiac tPA, 3 achieved complete and lasting resolution of hemolysis. Of the remaining 5 patients, one required emergent pump exchange, two developed progressive cardiogenic shock leading to death, one patient suffered a debilitating stroke after which care was withdrawn, and one underwent transplantation.

This case series displays that in a cohort of patients, intravenous tPA may be a plausible alternative to pump exchange for persistent hemolysis as a result of LVAD thrombosis. However, complications of this therapy, including hemorrhage and thromboembolism can lead to death making candidate selection paramount.