



Thoracic Transplant Quarterly Article Review

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[https://www.jhltonline.org/article/S1053-2498\(19\)31422-6/fulltext](https://www.jhltonline.org/article/S1053-2498(19)31422-6/fulltext)

Abstract: “BACKGROUND: After 3 years of continuous-flow left ventricular assist device (CF-LVAD) support, nearly a third of patients develop at least moderate aortic insufficiency (AI). Percutaneous occluder devices, surgical aortic valve replacement (SAVR), and urgent heart transplantation are available treatment options. Transcatheter aortic valve replacement (TAVR) has not been widely used for treating symptomatic AI in patients on LVAD support. METHODS: Retrospective chart review and data analysis from October 2010 through August 2017 was performed. A total of 286 patients with end-stage heart failure (ESHF) were implanted with a durable CF- LVAD. Nine patients subsequently developed significant symptomatic AI, which was treated with TAVR. RESULTS: All 9 patients had 1 TAVR procedure with resolution of AI and were discharged home. Procedural complications include valve migration warranting a second valve for stabilization, retroperitoneal and groin hematoma, and pseudoaneurysm requiring thrombin injection. A significant improvement of the New York Heart Association classification was noted from the time of implant to 6 months. Two patients had unplanned heart failure–related hospitalizations within 6 months. At 6 months, 89% of patients were alive on LVAD support. CONCLUSIONS: TAVR is a successful treatment modality for LVAD patients who develop symptomatic AI.”

Commentary by Barbara Wilkey, MD

Previous work by Jorde and colleagues¹ showed that, if no post-implantation preventative measures are taken, approximately 30% of patients with CF-LVADs will develop moderate or greater AI by 3 years post implantation. An immobile aortic valve at the time of discharge from implantation is strongly associated with the development of AI, even with stitch closure at the

time of implantation. In Jorde's cohort, 7 of 21 patients with moderate or greater AI developed heart failure requiring surgical intervention. Surgical interventions included transition to status 1A with subsequent transplantation, aortic valve surgery, and percutaneous closure of the aortic valve with an Amplatzer device. One additional patient developed symptomatic heart failure with AI, however this patient responded to an increase in the device's speed.

This quarter's article is a single center case series exploring the utility of TAVR for resolution of CF-LVAD associated AI. Though the topic has been discussed in the literature before, this is the largest case series to date. A total of 9 patients received TAVR, 8 via a femoral approach and 1 subclavian. CoreValve (4 patients) and Evolut (5 patients) were used as the primary valve. However, one patient had a CoreValve slip at implantation; this required snaring for repositioning and a Sapien 3 was deployed to stabilize the initial CoreValve. All patients had improvement of their heart failure symptoms, with pre and post-TAVR NYHA class means of IV and II respectively. One of the 9 TAVR patients died at 6 months from cardiac arrest. From the 6 to twelve-month mark, 3 TAVR patients died; 1 from intracerebral hemorrhage associated with an elevated INR, 1 from multisystem organ failure (MSOF) due to sepsis, and 1 from MSOF due to heart failure. In total, 56% were alive and on LVAD support at 1 year. Interestingly, at the 6-month follow up echo it was noted that half of the patients had closed aortic valves. None of the TAVR recipients had their LVAD speeds adjusted after implantation.² Long term follow up will be needed to see if immobility of TAVR leaflets is associated with the development of AI.

TAVR seems to be, at least in the short term, a viable solution for AI associated with CF-LVADs. Though TAVR is certainly less invasive than an open surgical approach, a prospective, randomized study would be ideal to ascertain differences in morbidity and mortality between the two approaches.

References:

1. JordeUP,UrielN,NahumiN,etal.Prevalence,significance,andmanagement of aortic insufficiency in continuous flow left ventricular assist device recipients. *Circ Heart Fail* 2014;7:310-9.
2. Yehya, A, Rajagopal, V, Meduri, C et al. Short-term results with transcatheter aortic valve replacement for treatment of left ventricular assist device patients with symptomatic aortic insufficiency. *J Heart Lung Transplant*. 2019; 38: 919–925.