

Peer Review File

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Reviewer A

The manuscript is well organized overall and includes opinions from experts, making it a very interesting paper. I would like to point out a few things.

1. Among the laboratory data in the text, TBIL, DBIL, CREA, UA, etc. are unfamiliar abbreviations. It would be better to use the full abbreviation instead of the abbreviation.

[We have modified our text as advised \(see page 4, line 123-130\).](#)

2. Two bioprosthesis were placed for TVAR. It would be good to add to the discussion an explanation as to whether it is advisable to anchor the self-expandable stent valve with two valves in other general AI patients.

[We have modified our text as advised \(see page 8, line 264-267\).](#)

3. In the conclusion of the Abstract, since this is a case report, “TAVR could be an effective, safe, and less in---” may be a more rounded expression than “TAVR is an effective, safe, and less ---”.

[We have modified our text as advised \(see page 2, line 63\).](#)

Reviewer B

- This is an interesting case, but there are many case reports in literature of TAVI in LVAD. A series with more than 20 patients was presented at the 37th EACTS annual meeting in Vienna.

[We haven't done much TAVIs in LVAD patients so far in China, this case could be valuable experience to our team, and in the procedure we anchored one more valve in the implanted valve to stabilize it, this could be a bit of innovation.](#)

- Figures should describe different pictures within, also explaining which anatomical regions of the heart.

[We have modified our text as advised \(see page 18, line 584-598\).](#)

Reviewer C

The authors presented a case report entitled “transcatheter aortic valve replacement in the management of aortic insufficiency secondary to left ventricular assist device implantation: a case report”. In this case, a patient who had received durable LVAD implantation suffered from aortic insufficiency, which was eventually treated by TAVR. The reviewer would like to congratulate their successful treatment. Several concerns have been raised.

1. There are several reports that presented the clinical implication of TAVR in patients with aortic insufficiency during durable LVAD support. The novelty of this report may not be so high.

We haven't done much TAVIs in LVAD patients so far in China, this case could be valuable experience to our team, and in the procedure we anchored one more valve in the implanted valve to stabilize it, this could be a bit of innovation.

2. It is unclear why the patient received LVAD implantation as destination therapy. The patient was relatively young.

The patient had dilated cardiomyopathy for 14 years, the effect of the medication gradually deteriorates, LVAD seems to be the last resort for the patient.

3. Did the authors attempt device speed adjustment to manage aortic insufficiency?

We tried to turn down the LVAD speed, the patient's condition was not improved, and we didn't have so much time to wait because of the critical condition.

Reviewer D

The authors report treatment of advanced aortic insufficiency in patients after LVAD implantation as destination therapy with TAVI using a self-expandable valve. TAVI for AI in LVAD patients has already been performed in considerable numbers, especially in the U.S., and good results have already been reported. Therefore, it is lack of novelty.

We haven't done much TAVIs in LVAD patients so far in China, this case could be valuable experience to our team, and in the procedure we anchored one more valve in the implanted valve to stabilize it, this could be a bit of innovation.

Reviewer E

The paper titled “Transcatheter aortic valve replacement in the management of aortic insufficiency secondary to left ventricular assist device implantation: a case report” is interesting. TAVR is an effective, safe, and less invasive means of restoring ejection fraction for patients with a LVAD who develop severe AI. However, there are several minor issues that

if addressed would significantly improve the manuscript.

1) SAVR and TAVR are among interventions available to address post-LVAD AI. Suggest conducting comparative analysis.

We have mentioned that transcatheter aortic valve replacement (TAVR) although technically challenging appears to have an advantage over surgical aortic valve replacement (SAVR) in the management of LVAD-acquired AI with a reduction in inpatient mortality and better inpatient outcomes (see page 3, line 84-87).

2) Please characterize the epidemiology and management of aortic valve disease following LVAD.

We have mentioned that 15–52% of patients develop significant AI in 1–2 years (see page 3, line 75), effective strategies for the treatment of these patients have not been well defined (see page 3, line 79-80), SAVR and TAVR could be effective managements(see page 3, line 84-91).

3) This study has only one case, which is too limited. It is recommended to increase the comparative analysis of the same or similar cases with other regions or countries.

TAVR has been applied successfully elsewhere for AI during LVAD support (see page 8, line 240-242), in this case we anchored one more valve in the implanted valve to stabilize it, we still can't find a similar case.

4) In the introduction of the manuscript, it is necessary to clearly indicate the knowledge gaps and limitations of prior study and the clinical significance of this study.

Effective strategies for the treatment of these patients have not been well defined. (see page 3, line 79-80) TAVR could be a good method. We shared the experience of this method and we hope to be helpful.

5) The introduction part of this paper is not comprehensive enough, and the similar papers have not been cited, such as “Concomitant cardiac surgery procedures during left ventricular assist device implantation: single-centre experience, Ann Cardiothorac Surg, PMID: 33842219”. It is recommended to quote the article.

We have quoted this article (see reference 9).

6) The description of the figure legends in this study is too simplistic, please describe in detail.

We have modified the figures as advised.

Reviewer F

1) First, I suggest the authors to indicate the short-term outcome of the TAVR.

Before discharge, biochemistry, liver function, and electrolytes recovered to normal levels. Echocardiography showed that the position of the artificial valve was fixed. There was no sign of artificial valve insufficiency and no thrombus in the supra-ventricular and left ventricular outflow tract, yielding an LVEF of 35%. (page 6, line 177-180).

- 2) Second, the abstract needs some revisions. The background did not indicate the limitations of existing treatment for AI after LVAD and what the potential clinical significance of this case is. In the case presentation, please provide more data on the clinical characteristics of this case including his past disease history, data for differential diagnosis, days till the discharge and long-term follow up outcomes. The current conclusion in the abstract and the main text is overstated since this is only a case report.

We have modified the text as advised (see Abstract).

- 3) Third, the introduction is not adequate. In addition to the first case receiving TAVR, the authors need to briefly review what has been known on the efficacy, safety, and indications of TAVR, explain why the current case deserved to be reported, and what the potential clinical significance of this case report was.

Severe acute AI did not respond well to medication, and re-operation meant higher risk to the patients, the most effective therapeutic strategies for LVAD-acquired AI still need further exploration. (page2, line 44-47)

- 4) Fourth, in the main text of the case presentation, please report detailed past history of this case, the baseline clinical characteristics, such as the control of hypertension, nutritional status, and co-morbid major medical conditions. The authors need to explain why they did not follow up the long-term outcomes of this case.

We have modified the text as advised. (page 4, line 109-116; page 6, line 181-185)

- 5) Fifth, in the discussion, please discuss why the current case has a good short-term outcome and what the lessons learned from this case are.

We have modified the text as advised (page 8, line 267-273).

- 6) Finally, please consider to cite several related papers: 1. Chatfield AG, Cheung A, Akodad M, Chuang A, Besola L, Sellers S, Wood DA, Sathananthan J, Webb J. Transcatheter solutions for transcatheter aortic valve replacement dysfunction: is redo transcatheter aortic valve replacement a durable option? *Ann Cardiothorac Surg* 2021;10(5):571-584. doi: 10.21037/acs-2021-tviv-85. 2. Yeats BB, Yadav PK, Dasi LP, Thourani VH. Transcatheter aortic valve replacement for bicuspid aortic valve disease: does conventional surgery have a future? *Ann Cardiothorac Surg* 2022;11(4):389-401. doi: 10.21037/acs-2022-bav-20. 3. Cahill TJ, Terre JA, George I. Over 15 years: the advancement of transcatheter aortic valve

replacement. *Ann Cardiothorac Surg* 2020;9(6):442-451. doi: 10.21037/acs-2020-av-24. 4. Kherallah RY, Koneru S, Krajcer Z, Preventza O, Dougherty KG, McCormack ML, Costello BT, Coulter S, Strickman NE, Plana Gomez JC, Mortazavi A, Díez JG, Livesay JJ, Coselli JS, Silva GV. Hemodynamic outcomes after valve-in-valve transcatheter aortic valve replacement: a single-center experience. *Ann Cardiothorac Surg* 2021;10(5):630-640. doi: 10.21037/acs-2021-tviv-131. 5. Chen S, Chau KH, Nazif TM. The incidence and impact of cardiac conduction disturbances after transcatheter aortic valve replacement. *Ann Cardiothorac Surg* 2020;9(6):452-467. doi: 10.21037/acs-2020-av-23.

[We have cited 4 papers in the manuscript \(reference 26-29\).](#)