

Reviewer #1:

**Scientific Quality:** Grade C (Good)

**Language Quality:** Grade B (Minor language polishing)

**Conclusion:** Minor revision

**Specific Comments to Authors:** minor revision

Ans: Thanks for the comment.

Reviewer #2:

**Scientific Quality:** Grade C (Good)

**Language Quality:** Grade B (Minor language polishing)

**Conclusion:** Minor revision

**Specific Comments to Authors:** The author report a case of “EchoNavigator virtual marker with an Agilis NxT steerable introducer facilitates transseptal transcatheter closure of mitral paravalvular leak”. 1.It’s better to add some details about Agilis NxT steerable introducer , and add some data about the comparison between surgery and transcatheter closure、 transseptal and transapical.Combine this case you can discuss why you choose transseptal approaching , what kind of PVLs fit this approaching. 2.You need to provide more clear image to illustrate the procedure

Ans: Thanks for the comments. We added some discussion in the revised manuscript.

1. In contrast to the fixed curve introducer, the Agilis NxT steerable introducer tip can be adjusted to various angles by rotating the knob on the handle. Therefore, we use the Agilis NxT steerable introducer to overcome difficulties when dealing with medial PVL defects.”
2. The transcatheter closure of PVL has been discussed in previous studies,<sup>[3,4]</sup> and the reported success rate generally ranges from 80% to 90%.<sup>[5,6]</sup> The clinical success rates and 5-year overall survival rates of transcatheter closure and surgical treatment of PVL are similar, however fewer in-hospital major adverse events have been reported with transcatheter closure.<sup>[7]</sup> We chose transseptal access rather than retrograde transapical access because it is less invasive and is associated with a lower risk of bleeding. However, there are still advantages in using transapical access, including easier wire probing (especially PVL defects

located at the medial aspect and when there is little room for device manipulation) and a shorter procedure time.

3. Several occluder devices to close PVL are currently available.<sup>[4]</sup> Among these devices, Amplatzer Vascular Plug (AVP) III and II are the most commonly used due to the ovoid shape of the lobe of AVP III which can fit the crescentic shape of PVL and the low profile of AVP II.
4. We also revised our figure to illustrate the procedure well.

Reviewer #3:

**Scientific Quality:** Grade C (Good)

**Language Quality:** Grade B (Minor language polishing)

**Conclusion:** Accept (General priority)

**Specific Comments to Authors:** The Authors described methods in adequate detail in the case report. The new hypotheses that this study proposed regarding the new image virtual marker with Agilis NxT steerable introducer can facilitate transseptal transcatheter closure of mitral paravalvular leak. The aim of this technique is the reduction of the procedure time and contrast media. The key problems in this field that this study has solved are: transseptal transcatheter closure of mitral paravalvular leak was performed efficiently by using the EchoNavigator virtual marker and Agilis NxT steerable introducer. Transcatheter Paravalvular Leak closure is a technically demanding procedure that requires accurate imaging planning and guidance. In case of radiolucent bioprosthesis, the absence of fluoroscopic landmarks represents a major technical challenge for the interventionalist. In this complex scenario, the Authors proposed a multimodality imaging strategy based on computed tomography and echocardiographic-fluoroscopic fusion imaging to achieve a successful transcatheter intervention.

Ans: Thanks for the comments. We added this comment into the discussion section.

“Fusion imaging using EchoNavigator software is very helpful if the bioprosthetic valve is radiolucent.”

Reviewer #4:

**Scientific Quality:** Grade B (Very good)

**Language Quality:** Grade B (Minor language polishing)

**Conclusion:** Minor revision

**Specific Comments to Authors:** In this manuscript, the authors reported a

case in which transseptal transcatheter closure of mitral paravalvular leak was performed by using the EchoNavigator virtual marker and Agilis NxT steerable introducer. My comments are as follows: 1) There are many writing and grammar errors in the text. These should be corrected by a native English speaker. 2) Other potential uses of the EchoNavigator virtual marker in cardiology practice should be discussed. 3) Pictures in the Figure 1 are too small. Details can not be easily seen. This should be corrected. 4) References should be re-written according to the Journal's style.

Ans: Thanks for the comments.

1. We send the MS to the native English speaker medical editor for revision to correct the errors.
2. Other clinical implications of EchoNavigator software include transcatheter edge-to-edge repair of the mitral valve, and transcatheter closure of the left atrial appendage. The procedure can be facilitated by making virtual markers on the site of clipping on the mitral valve and the orifice of the left atrial appendage.
3. We also revised our figure to illustrate the procedure well.
4. References had been re-written according to the Journal's style.

Reviewer #5:

**Scientific Quality:** Grade D (Fair)

**Language Quality:** Grade B (Minor language polishing)

**Conclusion:** Minor revision

**Specific Comments to Authors:** I congratulate the authors on this nice presentation. Para valvular leak closure via transcatheter approach is a technically demanding procedure. Using a fusion imaging approach definitely reduces the time required. The authors have demonstrated a procedural duration of 120 minutes with fairly matches the contemporary large case series and reports. However, a more detailed focus on the procedure for fusion imaging and additional images would help in better understanding to the readers. Also the fact that live three dimensional TEE imaging (LA side view) during the intervention gives wonderful imaging without the need of additional radiation exposure, this should be taken into consideration.

Ans: Thanks for the comments.

1. We have revised our MS to describe more details of the procedure.

“EchoNavigator transesophageal echocardiographic-fluoroscopic fusion imaging software (Philips Medical Systems, Best, the Netherlands) was used during the procedure (Figure 1). PVL was well visualized at the X-plane (zero and 90 °) in TEE. We used the mark function of the EchoNavigator software and easily adjusted marker 1 for the location of the PVL in the X-plane views of TEE. Virtual marker 1 then appeared in real-time fluoroscopic imaging indicating the PVL location.”

2. We added this precious comment into our discussion section. “We used real-time three-dimensional TEE imaging (left atrial side view) during the intervention which provided clear imaging without the need for additional radiation exposure or contrast media. Using a combination of fluoroscopy and TEE imaging avoided the need for contrast media, thereby minimizing the risk of further deterioration of renal function.”