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Letter to the Editor / Editöre Mektup

Are mechanical assist devices life-saving in acute cardiogenic shock?

Mekanik destek cihazları akut kardiyojenik şokta hayat kurtarıcı mıdır?

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Dear Editor,

We read the article with great interest by Orhan et al.[1] titled "Are mechanical assist devices life-saving in acute cardiogenic shock?" published in the Issue 3/2016 of the journal. However, we would like to address into some issues about the study results and share our comments and suggestions accordingly.

First, in the abstract section, the authors specified a patient population who were treated with long-term assist devices. However, as mentioned in the abstract section, the study results indicate short-term results of using mechanical assist devices. We would like the authors to comment on this issue to avoid any misunderstanding.

Second, in the article, the authors reported a survival rate of 28.5% in 14 patients (n=4) who underwent surgery. We believe that the route of the device insertion should be specified in survivors. In addition, the authors suggested that Centrimag was more appropriate in postcardiotomy patients in the Discussion section. We would like to learn the basis of this comparison. Similarly, it would be more reasonable to specify the device inserted in survivors in the postpartum cardiomyopathy setting.

As the last resort, mechanical assist devices (MADs) are undoubtedly life-saving for patients with acute heart failure. There are many publications and experiences reported in the literature. As mentioned by the authors, the timing of device insertion is of vital importance. These devices are also known as parachute devices: similar to parachutes, these devices have a special mechanism to be automatically opened at a predesignated altitude. Therefore, in patients with difficulty in weaning from cardiopulmonary bypass (CPB) during postcardiotomy, timing and appropriate techniques for MAD implantation are critical. These patients should be also followed per protocol. Although there are several techniques, they pose some disadvantages such as being invasive and additional technical problems. Thus, additional pathologies should be considered in these patients. Currently, venoarterial (VA) extracorporeal membrane oxygenation (ECMO) is implanted using one of three techniques: peripheral, central, and hybrid. Peripheral VA ECMO cannulation is associated with peripheral ischemia and the arterial cannula which is inserted percutaneously is associated with distal limb ischemia-related problems. Therefore, an arterial cannula which supplies blood to the distal is used through distal perfusion cannulation. Despite all efforts, ischemic problems may arise and local or distal limb problems may be seen after cannulation following ECMO. In addition, impaired left heart functions of the peripherally implanted ECMO may increase the retrograde afterload. Ventricular dysfunction may also lead to Harlequin syndrome.[2] To overcome this problem, hybrid ECMO can be performed passing the ECMO cannula or axillary artery through a graft. In our VA ECMO practice, we routinely perform hybrid technique using the axillary arterial cannulation through the Chimney grafts. This technique is also superior as it allows follow-up of the extubated patient and weaning and decannulation under local anesthesia. We also would like the authors to comment on this issue.

In recent years, in patients with ECMO in whom decompression is unable to be achieved due to increased afterload and ventricular load, addition of the left atrial vent to the system is a reasonable alternative, as the authors performed in their study. In this technique,

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there are applications in which ECMO and the Impella system, an axial flow pump, is used together.[3] We also would like the authors to comment on this issue and share their experiences.

Finally, we found some inconsistent results in the mortality rates in the Results section and the Tables. For instance, the authors reported that two of four patients with a MAD who were diagnosed with acute myocarditis survived and these patients received long-term left ventricular assist system, while myocardial improvement was seen in another patient. In addition, the cause of mortality was not stated in seven patients, although two patients developed acute exacerbation of chronic heart failure (n=8). We also would like the authors to shed light into this inconsistency.

Yours sincerely,

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Author Reply

Dear Editor,

First, we would like to thank our colleagues for their valuable comments and effort to improve the manuscript. In the Abstract section, we mentioned that this study was a retrospective study in which the patients who received short-term ventricular assist system due to acute cardiogenic shock and who were switched to long-term ventricular assist system later. We realize that we are unable to explicitly clarify the short- and long-term assist systems which may lead to ambiguity. In our manuscript, the term "short-term ventricular assist systems" was used for ECMO and Centrimag. Long-term ventricular assist systems referred to the permanently implanted left ventricular assist devices.

The devices which we used are listed in Figure 2. In a surviving patient with postpartum cardiomyopathy, we used the Centrimag device. In this patient, left heart failure was evident and we were able to extubate the patient without complications and wean from the device in the intensive care unit with recovery, compared to those in whom we used ECMO for a longer period of time.

Based on our experiences, we suggest that the Centrimag device is more suitable in patients with left ventricular insufficiency, as confirmed by intraoperative transesophageal examination, without any additional lung problem, due to the lack of membrane, with lower inflammation and hematological complications, which allows effective discharge in the left ventricle and gives time for myocardial recovery and avoid end-organ dysfunctions. Although ECMO can be used with axillary cannulation in this patient population with cardiogenic shock, it should be kept in mind that hematological and inflammatory complications related to the ECMO membrane are independent from the cannulation site. In our practice, we routinely use the Centrimag device in case of clinically isolated left ventricular insufficiency.

Furthermore, as summarized in Table 5, two of four patients with acute myocarditis survived in our study. One of the two survivors received long-term left ventricular assist device, while myocardial recovery was seen in the other patient. In addition, of the patients who died due to acute exacerbation of chronic heart failure, four died from multiorgan failure, two from infection-related septic shock, and one from uncorrected bleeding diathesis associated with hematological complications.

We hope that our comments would shed light into the uncertain issues and give further insight.

Yours sincerely,

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