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Commentary: Building bridges: Extracorporeal membrane oxygenation bridge-to-lung transplantation requires careful patient selection and management

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Temporary bridge-to-transplant (BTT) therapy has recently become a topic of great interest in the world of cardiothoracic transplantation. As we continue to shift toward preferentially transplanting sicker patients (ie, greater lung allocation scores) in an effort to reduce waitlist mortality, the implementation of extracorporeal membrane oxygenation (ECMO) BTT will continue to rise. In this limited review provided by Loor and colleagues,[1] they highlight several studies, specifically examining the use of ECMO as a bridge-to-lung transplantation, adding their own expertise and experience to provide a set of recommendations for how to practically implement BTT in this setting, and especially in the currently evolving paradigm of coronavirus disease 2019 (COVID-19) lung failure.

The crux of this discussion really amounts to identifying the patient populations that would actually benefit from BTT and, subsequently, maximizing the chances of success after lung transplantation. The former is fairly well defined in a recent publication by Habertheuer and colleagues[2] (and discussed in the present article). Their STABLE score highlighted 6 factors to predict in-hospital mortality after lung transplantation in ECMO BTT patients: age >50 years, >75 days on the wait list, dialysis, mechanical ventilation,

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CENTRAL MESSAGE

Bridge-to-lung transplant with extracorporeal support has become more common, especially in COVID-19 lung failure. These complex decisions require careful patient selection and management.

transplant center volume (<$/$> 50/year), and total bilirubin >1.2. Each 1-point increase in STABLE score equated to a 22% increase in the odds of in-hospital mortality. Very obviously, the first step in implementation of BTT is appropriate patient selection and in our opinion, the STABLE scoring system should provide the framework for that discussion.

Perhaps the biggest takeaway from the present article, to maximize patient outcomes, awake (and ideally ambulatory) ECMO should be the goal, and indeed the minimum criteria for continued consideration for listing. Loor and colleagues[1] highlight several ECMO cannulation strategies to facilitate this goal; however, even short of ambulation, aggressive physical therapy should be implemented. Muscle weakness acquired in the intensive care unit can result in up to 10% loss of muscle mass in less than a week, correlating to diaphragm weakness and more pronounced respiratory failure.[3,4] Very little should prevent patient participation if we can do our part to remove sedation and create a manageable invasive line set up to minimize potential risk.[3] As such, we maintain a low threshold for tracheostomy if this facilitates weaning sedation and greater participation in physical therapy. Awake/ambulatory ECMO portends the best post-transplant prognosis, and intuitively this should come as no surprise, as patient conditioning is a basic tenet of surgical care for any procedure. Generally, there are significant underlying reasons for

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immobility that prevents physical conditioning, and this context should prove enough to warrant discussions regarding the waitlist status of such a patient.

Finally, let us briefly touch on the topic of COVID-19 transplantation, which has been reported by our group and others.[5] The previous discussion still holds valid and should not be disregarded to address this new and evolving situation. If the patient's condition does not meet the basic thresholds espoused previously, listing for transplantation should be approached with extreme caution, and with the understanding that a long list of candidates in potentially better condition to survive surgery also await those organs.

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