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GUEST EDITORIAL

The art of lung transplantation—lessons learnt from one thousand lung transplants

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Transplant medicine is a combination of cutting-edge medical science and the traditional art of medicine. In the two thematic lung transplant issues of the *Indian Journal of Thoracic and Cardiovascular Surgery* (IJTC), experts in the field have focused on the evidence and science of lung transplant medicine to help guide the practice of lung transplantation in India. Temple University Hospital, Philadelphia, recently completed one thousand adult lung transplants. In this editorial, we discuss some pragmatic lessons which are not often reported in the literature, and which we have learnt through a combined experience of several decades and taking care of hundreds of lung transplant patients.

"Primum non nocere" (first do no harm) Patients and families rely on their physicians to provide the guidance for the "best" treatment for them, which is especially true when faced with life-threatening diseases. In certain situations, putting a patient through transplant will very likely lead to prolonged suffering or a poor outcome, such as prolonged critical illness, end-stage organ failure, or dependence on life support. In these situations, denying transplant is *humane* and aligns with the principle of "first do no harm." The role of a selection committee is crucial and helps provide independent insight into the best path forward and can help the treating physician make objective decisions, keeping the patients best interest in mind. [1]

"A friend in need is a friend indeed" A strong patient advocate and support system is an underappreciated factor which impacts patient outcomes. An effective advocate helps the patient navigate the post-transplant period, encourages them through rocky times, has the motivation and ability to be present at the bedside, and is willing to question the medical team to advocate for the patient. About 25 percent of lung transplant recipients have prolonged hospital stays and over 80 percent are readmitted to the hospital [2] putting a significant burden on patients and their care givers [3]. Although not a part of any prediction models, we believe the support system is one of the most important factors affecting outcomes, especially when the "chips are down." All our recipients undergo a thorough psychosocial evaluation pre-transplant, which includes evaluation of the support system and help to plan for various scenarios if things "don't go as planned." Post-transplant, we help provide continued support through social workers, nurses, and physicians to the patient's care providers to navigate these times. These services and assessments are not alluring, but form the bedrock for successful outcomes post-transplant [4].

"Time and tide wait for no man" We always aim to get a patient transplanted at the "perfect time," when they are sick enough to need a new lung, but well enough to have a smooth recovery. Some patients, even though may be medically ready to be listed, may be months away from being ready from a psychological, social, or financial standpoint. Work-up and management of comorbidities, education, establishing a social support system, arranging for adequate financial resources, and even deciding whether transplant is compatible with an individual's beliefs can take several months. Transplantation should not be an emergency or

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salvage treatment, and to make sure we don't miss our window of opportunity patients should be referred in a timely manner. International consensus documents help guide when is the right time to refer and list; however, they don't account for an individual patient circumstances, which only the treating physician is aware of [5]. Referral to lung transplantation should not be considered as "giving up" on medical management, rather should be looked at as a part of medical management, where we are "planning for the worst while hoping for the best."

"A journey of a thousand miles begins with a single step" Since the first lung transplant performed in 1983, the indications and contraindications for lung transplant have evolved rapidly. Transplant programs across the world have been pushing the envelope in donor and recipient selection, surgical techniques, and post-transplant care [6]. Often, what is now considered routine was once considered impossible. Examples of such advances include ex vivo lung perfusion, which has led to increased donor availability; septuagenarians are now routinely transplanted and an increasing number of patients with chronic infections such as human immunodeficiency virus or hepatitis C virus are being transplanted successfully. These advances all start with a "first case" and individual centers pushing the envelope with the goal to provide the most appropriate care for the patient, while advancing the field of transplant medicine. Such advances require tremendous support from governments, philanthropic organizations, hospitals, and most importantly our brave patients. Continued support from these quarters is needed to further the field of transplantation.

"Learn from the mistakes of others — you can't live long enough to make them all yourself." The global transplant community is closely knit, with 260 lung transplant centers from across the world reporting in the International Society for heart and lung transplant registry in 2019 [7]. Communication and collaboration between centers and sharing of successes and more importantly failures can help the entire field advance. There are several avenues available to share—scientific publications, registry data, professional societies, social media, and personal communication. We have learnt tremendously from discussing individual cases, techniques, care pathways, and protocols with people from across the globe to improve care of our patients. This sharing of information and collaboration is an invaluable service to our patients.

"No one knows what the future holds" Despite predictive tools, strict selection criteria, endless discussion, and risk mitigation, *no one* can predict the outcome for an individual patient. We have all seen patients, who were expected to "sail through" transplant, develop severe complications and some high-risk recipients have a smooth course. This could be due to unknown preexisting factors, or donor organ quality; however, very often it's due to factors not in our control and sometimes "pure luck." We are mindful of this unpredictability and strive to remain humble and honest about our limitations.

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