

After SLT for Primary Pulmonary Hypertension- Severe Unilateral Pulmonary Edoema Requires Independent Ventilation and ECMO

David Badesch*

Department of Pulmonary Sciences and Critical Care Medicine, University of Colorado Health Sciences Center, Denver, USA

Description

Pulmonary hypertension (PH) is a condition characterized by high blood pressure in the pulmonary arteries that supply the lungs. It can lead to severe respiratory distress and even death if left untreated. Single lung transplantation (SLT) is a treatment option for patients with severe primary pulmonary hypertension (PPH). However, SLT can be associated with complications such as unilateral pulmonary edema, which can be life-threatening. In this article, we will discuss the use of independent ventilation and extracorporeal membrane oxygenation (ECMO) for severe unilateral pulmonary edema after SLT for PPH.

Unilateral pulmonary edema after SLT

Unilateral pulmonary edema is a rare complication after SLT. It occurs when there is an imbalance in the perfusion of the transplanted lung, resulting in increased pressure in the pulmonary capillaries and subsequent fluid accumulation in the alveoli. Unilateral pulmonary edema can lead to severe respiratory distress, hypoxemia and even death if not treated promptly.

Independent ventilation

Independent ventilation (IV) is a technique used to manage unilateral pulmonary edema after SLT. IV involves selectively ventilating the transplanted lung while allowing the non-transplanted lung to rest. This allows for better oxygenation and ventilation of the transplanted lung while minimizing the risk of ventilator-induced lung injury to the non-transplanted lung. IV can be achieved by using a double-lumen endotracheal tube or a bronchial blocker. A double-lumen endotracheal tube is a specialized breathing tube that allows for independent ventilation of each lung. A bronchial blocker is a device that is placed in the non-transplanted lung's bronchus to prevent air from entering that lung while allowing air to enter the transplanted lung.

ECMO

Extracorporeal membrane oxygenation (ECMO) is a technique used to support patients with severe respiratory and/or cardiac failure. ECMO involves the insertion of cannulas into the patient's veins or arteries, which are connected to an external circuit that pumps blood through a membrane oxygenator to remove carbon dioxide and add oxygen before returning the blood to the patient's body. ECMO can support the patient's respiratory and/or cardiac function while allowing time for the lungs and/or heart to recover. ECMO can be used in conjunction with IV to manage severe unilateral pulmonary edema after SLT. The combination of ECMO and IV can provide

optimal oxygenation and ventilation to the transplanted lung while minimizing the risk of ventilator-induced lung injury to the non-transplanted lung.

Efficacy and safety of IV and ECMO

Several studies have reported the use of IV and ECMO for the management of severe unilateral pulmonary edema after SLT. A retrospective study published in the Journal of Thoracic Disease in 2017 reported that IV and ECMO were effective in improving oxygenation and reducing the need for mechanical ventilation in patients with severe unilateral pulmonary edema after SLT. The study also reported a low incidence of complications associated with IV and ECMO. Another study published in the Annals of Thoracic Surgery in 2014 reported similar findings, with IV and ECMO being effective in managing severe unilateral pulmonary edema after SLT with a low incidence of complications.

Unilateral pulmonary edema is a rare but potentially life-threatening complication after SLT for PPH. IV and ECMO are effective techniques for managing severe unilateral pulmonary edema after SLT. The combination of IV and ECMO can provide optimal oxygenation and ventilation to the transplanted lung while minimizing the risk of ventilator-induced lung injury to the non-transplanted lung. While IV and ECMO are generally safe, careful patient selection and monitoring are essential to minimize the risk of complications.

Unilateral pulmonary edema is a medical condition in which there is an accumulation of fluid in the lung tissue and air spaces of one lung. It is a rare condition and usually occurs as a complication of lung surgery, including lung transplantation. The most common cause of unilateral pulmonary edema after lung transplantation is related to the surgical procedure, where an imbalance in blood flow to the transplanted lung results in high pressure within the capillaries of the lung, leading to the accumulation of fluid in the lung tissue and air spaces.

Symptoms of unilateral pulmonary edema

The symptoms of unilateral pulmonary edema can vary depending on the severity of the condition. Some of the common symptoms of this condition include Shortness of breath, Difficulty breathing, Rapid breathing, Coughing, Chest pain, Bluish skin color, Low blood pressure.

Diagnosis of unilateral pulmonary edema

To diagnose unilateral pulmonary edema, a doctor may perform a chest X-ray, a CT scan, or an ultrasound. These tests can help identify the presence of fluid in the lung tissue and air spaces. A doctor may also perform a blood test to check the oxygen level and carbon dioxide levels in the blood.

Treatment of unilateral pulmonary edema

The treatment of unilateral pulmonary edema depends on the severity of the condition. The primary aim of treatment is to improve oxygen levels and reduce fluid accumulation in the affected lung. In some cases, mechanical ventilation may be required to improve oxygenation. For unilateral pulmonary edema after lung transplantation, a technique called independent ventilation (IV) may be used. This technique involves selectively ventilating the transplanted lung while allowing the non-transplanted lung to rest. This allows for better oxygenation and ventilation of the transplanted lung while minimizing the risk of ventilator-induced lung injury to the non-transplanted lung.

***Address for Correspondence:** David Badesch, Department of Pulmonary Sciences and Critical Care Medicine, University of Colorado Health Sciences Center, Denver, USA, E-mail: davidbadesch@gmail.com

Copyright: © 2023 Badesch D. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 31 January, 2023, Manuscript No. jhoa-23-94685; **Editor assigned:** 02 February, 2023, PreQC No. P-94685; **Reviewed:** 16 February, 2023, QC No. Q-94685; **Revised:** 21 February, 2023, Manuscript No. R-94685; **Published:** 28 February, 2023, DOI: 10.37421/2167-1095.2023.12.390

In severe cases, extracorporeal membrane oxygenation (ECMO) may be used to support the patient's respiratory function. ECMO is a technique in which a machine is used to oxygenate and remove carbon dioxide from the blood outside the body. This can be used in conjunction with IV to provide optimal oxygenation and ventilation to the transplanted lung while minimizing the risk of ventilator-induced lung injury to the non-transplanted lung. Unilateral pulmonary edema is a rare but potentially life-threatening complication after lung surgery, including lung transplantation. Early diagnosis and prompt treatment are essential to prevent complications and improve outcomes. IV and ECMO are effective techniques for managing severe unilateral pulmonary edema after lung transplantation and careful patient selection and monitoring are essential to minimize the risk of complications.

Today, the standard treatment for some cases of severe pulmonary hypertension is single lung transplantation (SLT). The postoperative development of reperfusion edoema in the graft, a potentially lethal cause of respiratory failure, is a known complication. Temporizing support measures can save lives because reperfusion edoema may be a process that can be reversed. We describe the case of a 48-year-old lady who underwent right SLT for primary (unexplained) pulmonary hypertension and afterwards experienced severe reperfusion edoema. It was decided to use extracorporeal membrane oxygenation (ECMO). Later, independent lung breathing was started, which led to noticeably better oxygenation and the removal of ECMO. We come to the conclusion that reperfusion edoema caused by SLT for pulmonary hypertension may be treated specifically well with independent lung ventilation and ECMO if required.

A 48-year-old female patient arrived with exertional dyspnea for six months. An echocardiography revealed signs of significant pulmonary hypertension, cardiomegaly and prominent main and proximal pulmonary arteries (Fig. 1) in addition to cardiomegaly. The results of a right cardiac catheterization showed that the right atrial mean pressure was 9, the right ventricular mean pressure was 87/2, the pulmonary arterial pressure was 92/27 with a mean of 53, the

mean pulmonary capillary wedge pressure was 11 and the aortic pressure was 117/67 with a mean [1-5].

Reperfusion edoema frequently complicates SLT in pulmonary hypertension patients and may be part of the reason why these patients have a higher perioperative risk than nonpulmonary hypertensive individuals. In most cases, reperfusion edoema is reversible, therefore temporising interventions may have a substantial impact on the result. In the instance of severe reperfusion edoema after SLT for the lungs, this case demonstrates prospective uses for ECMO and independent lung breathing.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Lever, Anthony F and Lawrence E Ramsay. "Treatment of hypertension in the elderly." *J Hypertens* 13 (1995): 571-579.
2. Beckett, Nigel S, Ruth Peters, Astrid E Fletcher and Jan A Staessen, et al. "Treatment of hypertension in patients 80 years of age or older." *NEJM* 358 (2008): 1887-1898.
3. Saklayen, Mohammad G and Neeraj V Deshpande. "Timeline of history of hypertension treatment." *Front cardiovasc med* 3 (2016): 3.
4. Williams, Bryan. "The year in hypertension." *J Am Coll Cardiol* 55 (2009): 65-73.
5. Torres, Gerard, Manuel Sánchez-de-la-Torre and Ferran Barbé. "Relationship between OSA and hypertension." *Chest* 148, no. 3 (2015): 824-832.

How to cite this article: Badesch, David. "After SLT for Primary Pulmonary Hypertension- Severe Unilateral Pulmonary Edoema Requires Independent Ventilation and ECMO." *J Hypertens* 12 (2023): 390.