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The first human application of a newly developed "smart all-in-one" extracorporeal life support device for bridging to lung transplantation: a case study

Young-Jae Cho[1], Dong Jung Kim[2], Sanghoon Jheon[2]

[1]Department of Pulmonology, Seoul National University Bundang Hospital, Republic of Korea
[2]Department of Thoracic and Cardiovascular Surgery, Seoul National University Bundang Hospital, Republic of Korea

The extracorporeal membrane oxygenation(ECMO) bridge-to-lung transplantation(TPL) is essential nowadays, however, there was no domestic ECMO device in Korea. Herein, we presented a patient with respiratory failure due to interstitial lung disease (ILD) aggravation who had a bridge to lung TPL with a newly developed "smart all-in-one" ECMO. A 59-year-old woman developed dyspnea and general weakness two months ago with subpleural reticular opacities and traction bronchiectasis in both lungs at chest computed tomography, probable connective tissue disease-associated ILD. Anti-nuclear and Anti-Sjogren's-syndrome(SS-A/RO) antibodies were positive. She took steroids and conservative care for a month but had suspected ILD aggravation due to pneumonia, transferred to our hospital under intubated state. Multiple infiltrates of both lungs and diffuse subcutaneous emphysema with progressive hypoxemia resulted in ECMO insertion. Elective Veno-venous ECMO, a newly developed "smart all-in-one" ECMO, as the first human clinical trial was applied for six hours and then changed to commercial ECMO. The sonography-guided femoral cannulation was done for 37 minutes without any procedural events. There were no device-related clinical and mechanical events. After 22 days of applying ECMO, she underwent bilateral cadaveric lung TPL. She needed venovenous ECMO for 2-3 days postoperatively and weaned thereafter. She is still in an alive, ambulatory state for more than two years. This is the first case of a newly developed ECMO system, which was expected comparable to foreign devices and contributable to reducing medical expenses and treating critically ill patients who need thoracic transplantation.