OS153 A SINGLE CENTER EXPERIENCE OF EX-VIVO LUNG PERFUSION PROGRAM: EARLY AND LONG TERM POST-TRANSPLANT OUTCOME

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Introduction: Ex vivo lung perfusion (EVLP) potentially allows to reduce the donor pool shortage, however its efficacy has been recently questioned.
Methods: We analyzed donors and recipients characteristics and early and long term outcomes of transplant procedures performed at the Milan Lung Transplant Center from January 2011 to December 2018comparing transplants from standard lung donors versus organs undergone EVLP.
Results: One hundred ninety-one lung transplants have been performed throughout the study period. Fifty EVLP procedures were performed resulting in 31 lungs accepted for transplantation. In the EVLP cohort 7 lungs were retrieved from donors after cardiac death and 24 lungs from donors after brain death with suboptimal function. Recipient characteristics were similar in the two cohorts with a trend toward higher severity score in the EVLP cohort. EVLP treated lungs underwent longer total preservation time. Early after transplantation, recipient of lungs undergone EVLP showed lower oxygenation and slight prolongation in the duration of mechanical ventilation without this affecting the duration of intensive care unit stay and early mortality rate. Long-term probability of overall survival and of survival free of chronic lung allograft disease did not differ between the groups (Log Rank Kaplan-Maier analysis, p value respectively 0.581 and 0.327).

	STANDARD Group (n = 160)	EVLP Group (n = 31)	p value
DONORS			
PaO2/FiO2, mmHg	456 [387; 518]	289 [230; 323]	< 0.001
Total Preservation Time 1st Lung, min	307 [240; 375]	867 [706; 939]	< 0.001
Total Preservation Time 2nd Lung, min	520 [456; 589]	1052 [968; 1175]	< 0.001
RECIPIENTS			
Disease, n (%)			0.577
Cystic Fibrosis	77 (48)	18 (58)	
Pulmonary Fibrosis	52 (32)	7 (22)	
COPD	14 (9)	3 (10)	
Other	17 (11)	3 (10)	
LAS	39.2 [34.6; 49.5]	44.9 [36.0; 60.5]	0.079
ECMO bridge to LuTx, n (%)	20 (12)	4 (13)	0.815
OUTCOME			
PaO2/FiO2 at 24 h, mmHg	304 [230; 378]	260 [199; 292]	0.005
PGD 2-3 at 72 h, n (%)	35 (22)	7 (23)	0.910
Ventilator Free Days (28 days), days	27 [22; 28]	25 [19; 27]	0.035
ECMO post-operatory, n (%)	29 (18)	11 (35)	0.053
ICU LOS, days	4 [2; 9]	6 [3; 12]	0.218
30 days survival, n (%)	159 (99)	30 (97)	0.735

Conclusions: The EVLP program allowed to increase the number of transplants by about 20% and to expand the lung donor pool to donors after cardiac death. Recipient of lungs undergone EVLP required more ventilatory support in the early phase after transplantation without affecting early and long term outcomes.

OS154 ELECTROLYTE BALANCE STABILIZATION BY CONTINUOUS DIALYSIS DURING EX VIVO LUNG PERFUSION IN PIG MODEL

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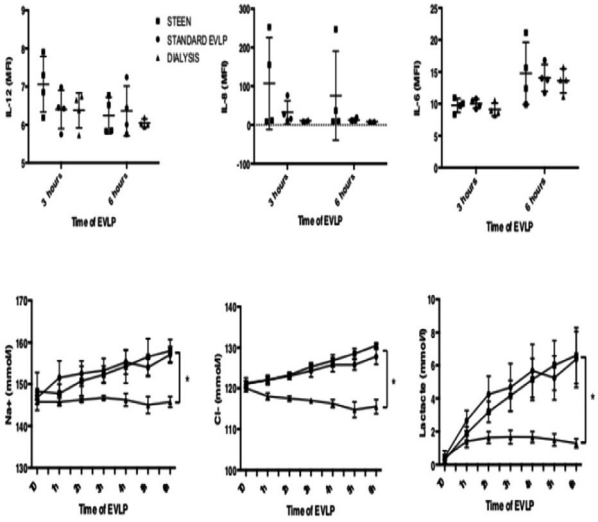
Introduction: Ex vivo lung perfusion (EVLP) has improved the lung donor management in different kind of situation. Unfortunately, stability of the process is limited around few hours. One of the reasons could be explain by an electrolytic and acid-base imbalance.

Our objective in this study was to test the safety and efficacy of continuous dialysis during EVLP in a pig model.
Methods: On a DCD swine model and after one hour of cold ischemia, a 6-hours EVLP procedure according to the Toronto protocol was performed. Three groups of four double lungs were compared. Group STEEN : no modification of perfusate. Group STANDARD EVLP : 500 mL of Steen solution is replaced every 2 hours. Group DIALYSIS : Perfusate was continuously run through a dialysis machine (Fresenius). EVLP physiologic and ventilatory parameters, perfusate biochemistry and inflammatory biomarkers were assessed every 30 minutes.
Results: Physiologic, ventilatory parameters and gaz exchange were comparable between the three groups. Electrolyte balance, determined by stabilization of sodium, potassium, calcium, magnesium ion concentrations in the perfusate, was significantly improved in the Dialysis group. Stability of the metabolic profile was obtained in the dialysis group while a significant variation with lactate accumulation and a decrease of glucose levels were significantly recorded in other groups. Proinflammatory Cytokine expression profile seems to be improve by dialysis.
Conclusion: Continuous perfusate dialysis is effective and safe during short EVLP for stabilizing electrolyte balance. Since this procedure improve the perfusate solution, further studies are needed to evaluate the beneficial effect on prolonged EVLP and post-transplant lung function.



OS155 TARGETING LATENT CYTOMEGALOVIRUS (CMV) WITH A NOVEL FUSION TOXIN PROTEIN USING EX VIVO LUNG PERFUSION (EVLP) AS A PLATFORM

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Background: Donor to recipient CMV mismatch leads to high incidence of CMV infection post lung transplantation causing devastating impacts in patient outcomes. EVLP is a potential platform to modify grafts prior to transplantation. We hypothesized that EVLP delivery of F49A-FTP, a fusion toxin protein that targets with ultra-high affinity cells expressing the latent CMV protein *US28*, may safely clear latent CMV from donor lungs, thus attenuating viral reactivation post transplant and leading to better clinical outcomes.
Methods: Human donor lungs rejected for transplantation were placed on EVLP alone (n = 2) or EVLP with 1 mg/L of F49A-FTP (n = 2) for 6 hours. Lung viral burden was quantified through RT-qPCR measurements of US28 and since F49A-FTP induces apoptosis of the cells expressing US28 (CD34 + stem cells and CD14 + monocytes), flow cytometry was used to quantify the proportion of these cells in lung tissue collected pre- and post-perfusion.

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