

## The diaphragm before and after lung transplant (LT)

**A LoMauro<sup>1</sup>, A Aliverti<sup>1</sup>, E Privitera<sup>2</sup>, M Vergari<sup>3</sup>, I Righi<sup>4</sup>, M Sgroia<sup>2</sup>, D Tosi<sup>5</sup>, V Rossetti<sup>6</sup>, F Briganti<sup>6</sup>, P Frykholm<sup>7</sup>, C Colombo<sup>8</sup>, M Nosotti<sup>2</sup>, A Palleschi<sup>2</sup>**

<sup>1</sup>Dipartimento di Elettronica, Informazione e Bioingegneria Politecnico di Milano, Milan, Italy

<sup>2</sup>Thoracic Surgery and Lung Transplant Unit, Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico, Milan, Italy

<sup>3</sup>Clinical Center for Neurostimulation, Neurotechnology, and Movement Disorders, Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico, Milan, Italy

<sup>4</sup>Pneumology Unit, Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico, Milan, Italy

<sup>5</sup>Department of Surgical Sciences, Section of Anesthesiology and Intensive Care, Uppsala University, Uppsala, Sweden

<sup>6</sup>Pediatric Cystic Fibrosis Unit, Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico, Milan, Italy

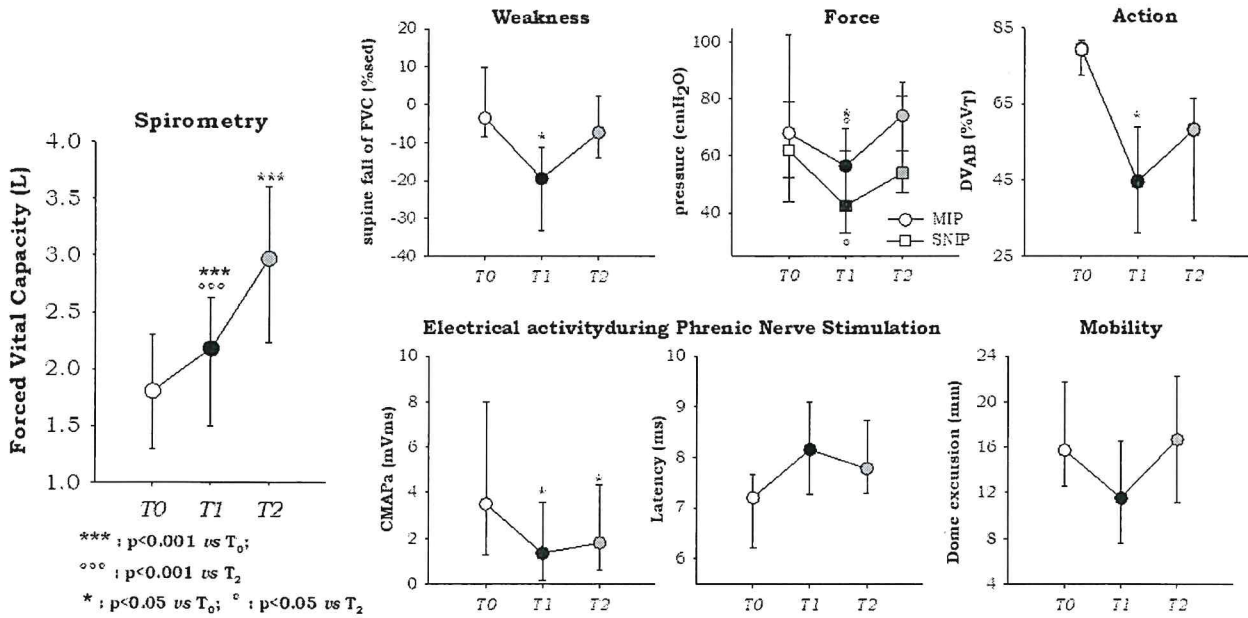
The diaphragm is the main respiratory muscle. Because possible abnormality of phrenic nerve conduction is reported after cardiothoracic surgery, we aimed to evaluate the function of the diaphragm after LT.

Thirty patients (age:42 yrs, LAS:36) were evaluated before, one month(T<sub>1</sub>) and 3 months(T<sub>2</sub>) after LT. At each visit, the diaphragm was evaluated in terms of weakness (supine fall of forced vital capacity), electrical activity (CMAPa:compound motor action potential area during phrenic nerve stimulation(PNS)), force (maximal inspiratory pressure and sniff pressure), displacement (abdominal contribution to tidal volume in supine) and mobility (excursion of the dome assessed by ultrasound). The latency during PNS was also quantified.

All the diaphragmatic parameters deteriorated at T<sub>1</sub>, and at T<sub>2</sub> CMAPa was further reduced. While spirometry continuously improved, 77% of patients needed nocturnal ventilatory support at T<sub>1</sub>, 36% at T<sub>2</sub>(figure1)

LT, per se, reduces the function of the diaphragm in terms of force, weakness, activation and displacement. We assume that the use of ice during LT may induce stupor of the phrenic nerve, as shown by low CMAPa that results from loss of motorneurons. The main consequence is the need of nocturnal ventilation, because during the REM phase of sleep ventilation depends on a functioning diaphragm.

Our results suggest the importance of an integrated approach after TX in all patients, even in case of proper clinical course and good spirometry.



Median and interquartile range of forced vital capacity, its supine fall in supine position, maximal inspiratory pressure (MIP), sniff pressure (SNIP), the percentage abdominal contribution to tidal volume in supine position ( $\Delta V_{ab}$ ), the compound motor action potential area (CMAPa) and the latency during phrenic nerve stimulation and the excursion of the dome of the diaphragm in patients before (T0), one month (T1) and three months (T2) after bilateral lung transplantation.

**Session:**  
**Moving lung transplantation forward (Thematic poster)**  
**Date/Time:**  
 Monday, September 17, 2018 / 12:50-14:40  
**Room:**  
 TP-16  
**Category:**  
 Transplantation  
**Keywords:**  
 Chronic diseases, Cystic fibrosis, Respiratory muscle



**PA2582** **Surgical management of pulmonary hydatid cyst with a thoroscopic approach**  
Sarrah Zairi (Tunis, Tunisia), Sabrine Louhaichi, Mehdi Abdennadher, Monia Attia, Amira Dridi, Hazem Zribi, Henda Neji, Sonia Ouerghi, Saoussen Hantous, Khaoula Ben Miled, Taher Mestiri, Adel Marghli

**PA2583** **Features and management of iatrogenic tracheal stenosis**  
Sabrine LOUHAICHI (Ariana, Tunisia), Sarrah Zairi, Abdelmalek Jelassi, Besma Hamdi, Mahdi Abdennadher, Hazem Zribi, Amira Dridi, Jamel Ammar, Adel Marghli

TP-16

Session 277

12:50 - 14:40

Thematic poster: Moving lung transplantation forward

**Disease(s)** : Respiratory infections, Interstitial lung diseases, Respiratory critical care, Thoracic oncology, Airway diseases, Pulmonary vascular diseases, Respiratory infections

**Method(s)** : Cell and molecular biology, General respiratory patient care, Physiology, Respiratory intensive care, Endoscopy and interventional pulmonology, Transplantation

**Chairs** : Are Martin Holm (Oslo, Norway), Cécile Robinson (Zürich, Switzerland), James Laurence Lordan (Newcastle upon Tyne (Tyne and Wear), United Kingdom), Federica Meloni (Pavia (PV), Italy)

**PA2584** **LSC - 2018 - Development of a hybrid alginate-ECM hydrogel as a potential bioink for 3D bioprinting**  
Martina M. De Santis (Lund, Sweden), Darcy Wagner (Lund, Sweden), Chiharu Ota (chipaota@gmail.com / Comprehensive Pneumology Center (CPC), Helmholtz Zentrum Munich, Munich), Rita Costa (rita.costa@helmholtz-muenchen.de / Comprehensive Pneumology Center (CPC), Helmholtz Zentrum Munich, Munich), Ali Doryab (ali.doryab@helmholtz-muenchen.de / Comprehensive Pneumology Center (CPC), Helmholtz Zentrum Munich, Munich), Hani N. Alsafadi (hani.alsafadi@helmholtz-muenchen.de / Comprehensive Pneumology Center (CPC), Helmholtz Zentrum Munich, Munich), Deniz Bolukbas (deniz.bolukbas@med.lu.se / Department of Experimental Medical Sciences, Lund University, Lund), Melanie Königshoff (MELANIE.KOENIGSHOFF@UCDENVER.EDU / Department of Medicine, University of Colorado, Denver), Darcy E. Wagner (darcy.wagner@med.lu.se / Department of Experimental Medical Sciences, Lund University, Lund)

**PA2585** **LSC - 2018 - Laser-capture microdissection, mass spectrometry and immunohistochemistry reveal pathological alterations in the extracellular matrix of transplanted lungs**  
Catharina Mueller (Lund, Sweden), Emma Ahlman (emma.ahlman@med.lu.se / Lung Biology Unit, Department of Experimental Medical Science and Division of Infection Medicine, Department of Clinical Sciences, Lund University, Lund), Leif T. Eriksson (leif.eriksson@med.lu.se / Lung Biology Unit, Department of Experimental Medical Science, Lund University and Department of Respiratory Medicine and Allergology, Lund University Hospital, Lund), Katharina Wassilew (katharina.wassilew@regionh.dk / Department of Pathology, Copenhagen University Hospital, Rigshospitalet, Copenhagen), Hans H. Schultz (Hans.Henrik.Lawaetz.Schultz.01@regionh.dk / Section for Lung Transplantation, Department of Cardiology, Copenhagen University Hospital, Rigshospitalet, Copenhagen), Hans Brunnstrom (hans.brunnstrom@med.lu.se / Department of Clinical Sciences in Lund, Division of Oncology and Pathology, Lund University and Department of Genetics and Pathology, Division of Laboratory Medicine, Region Skåne, Lund), Michael Perch (Michael.perch@regionh.dk / Section for Lung Transplantation, Department of Cardiology, Copenhagen University Hospital, Rigshospitalet, Copenhagen), Martin Iversen (martin@iversen-net.dk / Section for Lung Transplantation, Department of Cardiology, Copenhagen University Hospital, Rigshospitalet, Copenhagen), Johan Malmstrom (johan.malmstrom@med.lu.se / Division of Infection Medicine, Department of Clinical Sciences Lund, Lund University, Lund), Gunilla Westergren-Thorsson (gunilla.westergren-thorsson@med.lu.se / Lung Biology Unit, Department of Experimental Medical Science, Lund University, Lund)

**PA2586** **Safety of antifibrotic drugs in idiopathic pulmonary fibrosis patients awaiting lung transplantation**  
Roxana Genoveva Chirinos Guevara (barcelona, Spain), Eduardo Vélez, Cristina Berastegui, Ana Villar, Eva Revilla, Helena Sintes, Berta Sáez, Manuel López Meseguer, Carles Bravo, Victor Monforte, Antonio Roman, Irene Bello, Judit Sacanell

**PA2587** **Significant associations between Escape-avoidance coping and emotional distress in patients evaluated for lung transplant**  
Torunn Stavnes Søyseth (Oslo, Norway), Mary Amanda Dew, May Brit Lund, Gro Killi Haugstad, Vidar Soyseth, Ulrik Fredrik Malt

**PA2588** **Cardiovascular Autonomic Control in Lung Transplantation Recipients**  
Valeria Rossetti (Milano (MI), Italy), Giulia Coti Zelati, Eleonora Tobaldini, Letizia Corinna Morlacchi, Domenica Federica Briganti, Linda Bassi, Ilaria Righi, Stefano Aliberti, Paolo Tarsia, Nicola Montano, Francesco Blasi

**PA2589** **The diaphragm before and after lung transplant (LT)**  
Antonella LoMauro (Milano (MI), Italy), Andrea Aliverti, Emilia Privitera, Maurizio Vergari, Ilaria Righi, Manuela Sgroia, Davide Tosi, Valeria Rossetti, Federica Briganti, Peter Frykhol, Carla Colombo, Mario Nosotti, Alessandro Palleschi

**PA2590** **Cardiopulmonary response to exercise after lung transplantation**  
Mariann Ulvestad (Oslo, Norway), Michael Thomas Durheim, May Brit Lund, Johny Kongerud, Stian Roterud, Elisabeth Edvardsen



