13th EUROPEAN CONGRESS

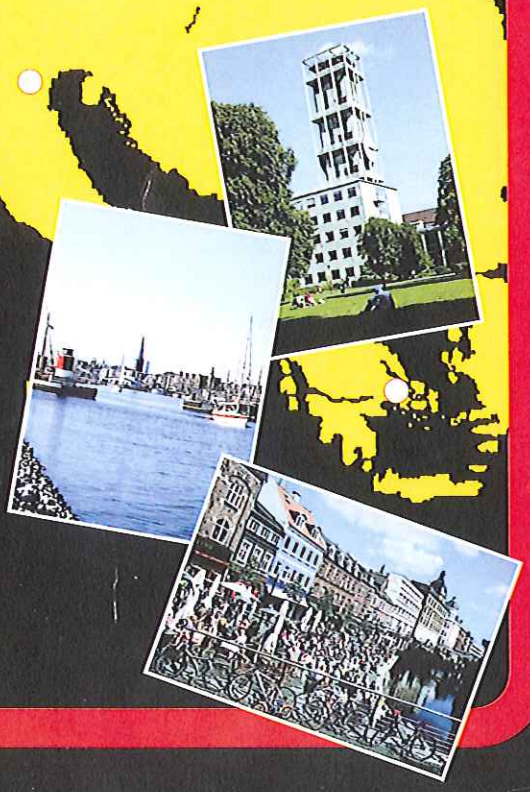
on

Extracorporeal Circulation Technology

JUNE 17th - 20th, 2009

AARHUS, DENMARK

ABSTRACTS



3. *Fat contamination of pericardial suction blood and leukocyte filtration in extracorporeal circulation*

Author(s) *Alberto Tripodi,* Simone Calvi, Antonio Petralia, Andrea Cavallucci, Cinzia Goni, Franco Guerrini, Mustapha Jmili, Barbara Ronchi, Anfrea Beliamore, Mauro Lamarra
Department(s) Cardiovascular Surgery and Perfusion
Institution(s) Villa Maria Cecilia Hospital, Cotignola, Italy

Objectives
Despite recent improvements in cardiopulmonary bypass techniques, brain damages remain significant sequelae after cardiac surgery, affecting about 20% to 80% of cases according to many authors. Pericardial suction blood is the main responsible of the systemic inflammatory response. Besides it is a potential mayor source of lipid emboli during cardiopulmonary bypass, thus increasing morbidity and mortality especially in combined surgery and elderly patients. Recently biomedical industries have been trying to develop new oxygenator devices able to remove lipid particles and leukocytes from pericardial suction blood. In the current study we counted the number of lipid particles and leukocytes in the pericardial suction blood and we evaluated the effectiveness of a new oxygenator device in removing those components.

Methods
We enrolled 20 cardiac surgical patients who have been submitted to a valvular or coronary artery surgical operation at our institution. We used a RemoweLL (Eurosets, Medolla, Italy) oxygenator, which contains a special cardiotomy unit designed for leukocyte and lipid particles removal from pericardial suction blood. The intracavitary blood drains into a different reservoir. Lipid particles subtraction is achieved by sedimentation, while filtration is responsible of leukocytes depletion. In order to evaluate the efficiency of this new device, blood samples have been taken before and after filtration to assess dimension and amount of lipid particles and leukocytes.

Results
No lipid particles amount differences have been found between valvular and coronary patients in blood taken before entering the filtering system. The mean lipid particles diameter was 15 micrometers. Pre-filtration and post-filtration lipid particles were 2970 ± 1405.29 and 1095 ± 579.00 respectively, determining a 63% ± 8.4% removal percentage . Leukocytes were 6.300/dl ± 2.58 and 2.980/dl ± 1.66 before and after filtration respectively, counting for a 52% ± 9.00% removal percentage.

Conclusions
The effectiveness of this new oxygenator device in depleting lipid particles and leukocytes from the bloodstream has been evaluated by this propedeutical study. While a common cardiotomy and arterial filters have usually 20 micrometers pores, our study demonstrates that lipid particles have a mean diameter of about 15 micrometers, thus new devices are needed. Further studies have to be performed in order to assess the clinical outcome of patients operated on cardiopulmonary bypass with this new device, especially regarding their neurological outcome and the occurring of renal, pulmonary, intestinal and spleen injuries.