Poster 04 Novel pleural lavage biobanking during thoracic surgical procedures facilitates advanced pleural fluid studies in patients with pulmonary diseases

Mircea Gabriel Stoleriu[1,2,3], Michael Gerckens[3,4], Carlo Mümmler[3,4], Johannes Krämer[1,2,3], Georg Mertens[1,2,3], Matilde Lombardi[1,2,3], Önder Yildirim[3], Jürgen Behr[3,4], Christian Schneider[1,2,3], Rudolf Hatz[1,2,3] and Nikolaus Kneidinger[3,5]

[1]Division for Thoracic Surgery Munich, LMU University Hospital Munich, Germany
[2]Asklepios Lung Clinic Gauting, Germany
[3]Institute for Lung Health and Immunity and Comprehensive Pneumology Center with the CPC-M bioArchive, Helmholtz Zentrum Munich, Germany
[4]University Department of Medicine V, LMU University Hospital Munich, Germany
[5]Division of Pulmonology, University Clinic for Internal Medicine, Graz, Austria

Background

Lung diseases are frequently associated with pleural changes. However, few is known about the pleural fluid in individuals without pleural effusions. Pleural lavage is a technique where physiological saline solution is instilled into the pleural space to obtain diluted pleural fluid. The aim of the study was to analyze the sampling, safety and feasibility of pleural lining fluid collection upon pleural lavage.

Methods:

We obtained informed consent from 264 patients with lung/pleural diseases undergoing thoracic surgery at the Asklepios Lung Clinic Gauting (03/2023-03/2025). Upon opening of the thoracic cavity an initial pleural lavage with 100-150 ml physiological saline solution was performed in patients without pleural effusions. Native pleural effusions were sampled as control group. Urea measurements in pleural effusion and pleural lavage were performed and compared to serum urea levels to determine the dilution factor of the pleural lining fluid, as previously described.

Results

49 patients (18,6%) had an initial pleural effusion, while 215 patients (81,4%) had no pleural effusion. Of 215 patients undergoing pleural lavage upon opening of the thoracic cavity, 73 (34%) patients experienced a pleural affection. 173 patients experienced a malignant lung disease, whereas 42 patients presented benign lung lesions. Typically, 3-15 ml of pleural lining fluid were obtained when performing a pleural lavage, as calculated by the urea dilution method. Hemacolor Pappenheim cytospin stainings showed striking similarities in pleural lavages and effusions. No complications upon pleural lavage sampling were observed.

Conclusion

Intraoperative pleural lavages are novel biosamples collected during thoracic surgery. The biosampling is feasible and safe. With over 250 samples in storage, the University Division for Thoracic surgery with Asklepios Lung Clinic Gauting has become one of Germany's largest biorepositories for pleural effusions and lavages. Investigations of pleural lining fluid will broaden our biomolecular understanding of the pleura biology and facilitate the development of novel pleural biomarkers.