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Title: The utility of vibration response imaging for calculation of ppoFEV1 and ppoD_{L,CO} in patients with lung cancer referred for resection – The influence of coexisting COPD

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Body: Background: Patients with operable lung cancer often have coexisting obstructive lung disease that reduces their ability to endure additional loss of pulmonary function. Aim: To investigate whether coexisting COPD influences the calculation of predicted postoperative (ppo) values by means of vibration response imaging (VRI) in patients with lung cancer referred for resection. Patients and methods: Seventeen patients with non small cell lung cancer (mean±SD age=60.6±8.6 years) referred for anatomical lung resection were studied. They underwent comprehensive spirometry testing, diffusion measurements (MasterScreen Diffusion, E. Jaeger, Germany) and vibration response imaging (VRIxp, DeepBreeze, Israel) before and 30 days after the resection. The calculation of the ppo values was carried out with proprietary software O-Plan. Results: Thirteen lobectomies and 4 pneumonectomies were performed in the studied population (12 males/5 females). Strong correlations were found between the ppoFEV1 (% pred) and ppoD_{L,CO} (% pred) values predicted with VRIxp O-Plan and the actually measured values 30 days postoperatively (r=0.794; p<0.05 and r=0.879; p<0.001, respectively). The patients were then divided to COPD and non-COPD groups. In the COPD group ppo value of FEV1 was predicted with greater accuracy (r=0.887; p<0.05) while the prediction of ppoD_{L,CO} was similar in both groups (r=0.919; p<0.05 in COPD group and r=0.944; p<0.05 in non-COPD). Conclusion: VRI correctly predicts postoperative values for FEV1 and D_{L,CO}. In patients with COPD the calculation of ppoFEV1 is more accurate compared to non-COPD group.