

Online supplement

Associations of airway tree to lung volume ratio on computed tomography with lung function and symptoms in chronic obstructive pulmonary disease

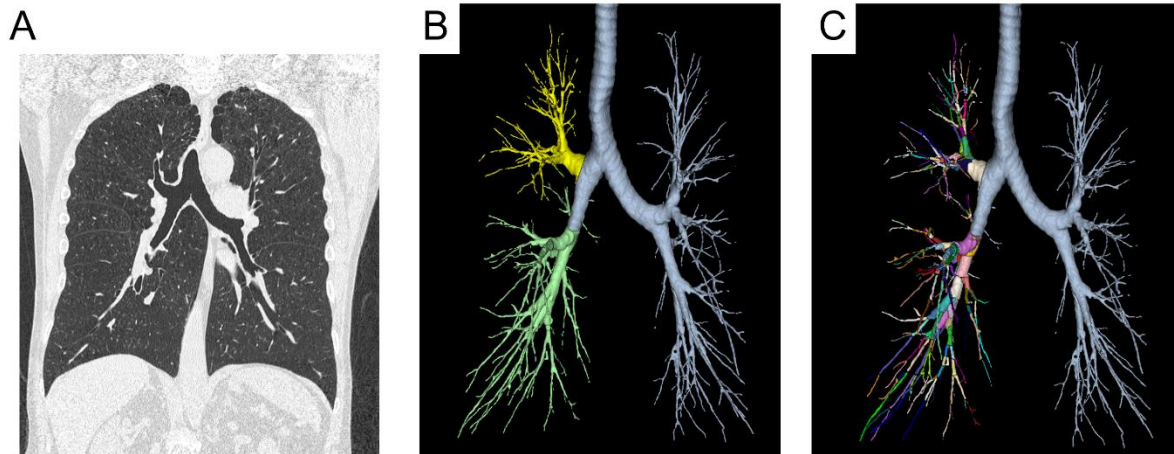
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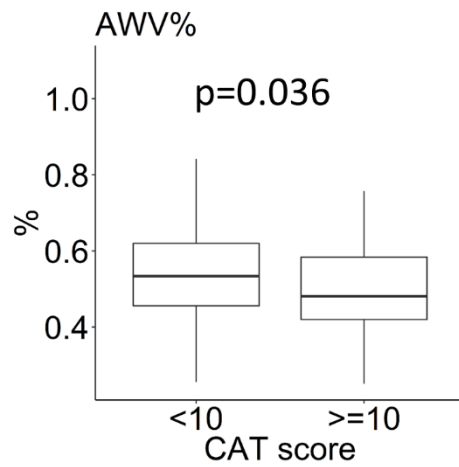
- **Figure S1. Examples of original CT images and segmentations of airway trees and all branches in the right lung**
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Figure S1. Examples of original CT images and segmentations of airway trees and all branches in the right lung



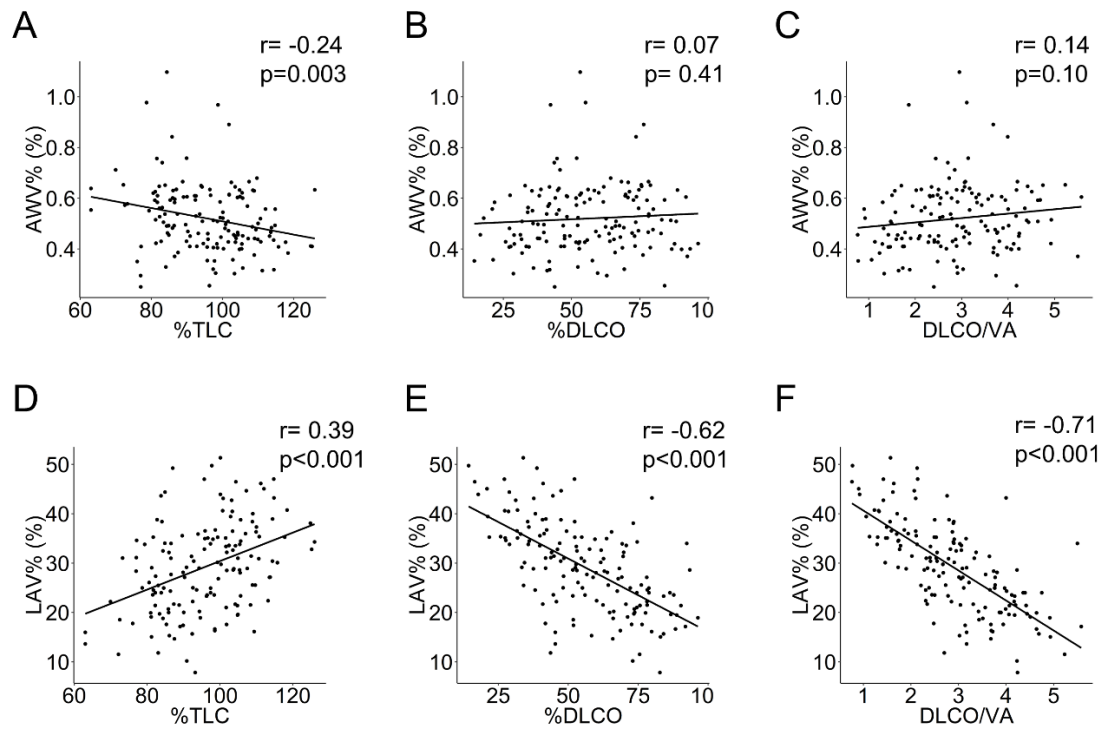
The airway tree was automatically segmented from the original CT image (A), and the portions of the right upper and middle-lower lobes (RUL and RMLL) were extracted (B, red and green parts). (C) The total airway count (TAC) was also measured by labelling all branches in the tree.

Figure S2. The airway volume percent in symptomatic and non-symptomatic subjects.



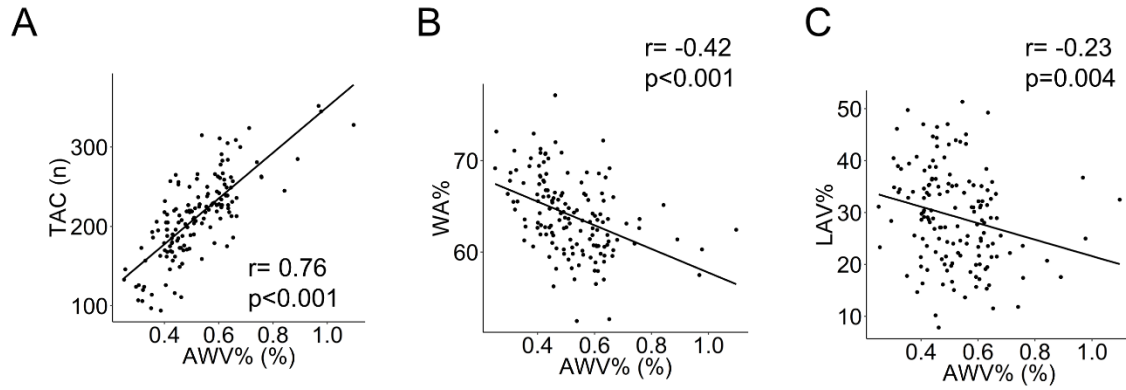
Symptoms were assessed with the COPD assessment test (CAT score). The airway volume percent (AWV%) in symptomatic ($CAT \geq 10$) was lower than non-symptomatic ($CAT < 10$) subjects.

Figure S3. Associations of the airway volume percent and low attenuation volume percent with physiological measurements



The airway volume percent (AWV%) was correlated with (A) percent total lung capacity (%TLC), but not with (B) percent diffusing capacity of the lung for carbon monoxide (%DLCO) and ratio of diffusing capacity to alveolar ventilation (DLCO/ V_A). The low attenuation volume percent (LAV%) was correlated with (D) %TLC, (E) %DLCO, and (F) DLCO/ V_A .

Figure S4. Associations of the airway volume percent with currently established CT indexes



The airway volume percent (AWV%) was correlated with the (A) total airway count (TAC), (B) wall area percent (WA%) for sub-segmental airways, and (C) low attenuation volume percent (LAV%).

Table S1. Multivariate regression models regarding pulmonary function

%FEV₁	CT measures	R²	AIC
Model 1	LAV%	0.21	389
Model 2	AWV%	0.34	364
Model 3	LAV%+AWV%	0.47	332
RV/TLC	CT measures	R²	AIC
Model 1	LAV%	0.22	388
Model 2	AWV%	0.34	362
Model 3	LAV%+AWV%	0.38	355

FEV₁ = forced expiratory volume in 1 second, RV/TLC = residual volume / total lung capacity, LAV% = low attenuation volume percent, and AWV% = airway volume percent. Multivariate linear regression models to estimate %FEV₁ and RV/TLC were made by using (1) LAV%, (2) AWV%, and (3) both LAV% and AWV%. All models were adjusted by age, BMI, pack-years, and CT-measured total lung volume. R² = adjusted R-squared. AIC = Akaike information criterion to compare quality of different models, where lower AIC indicates better model.