Pulmonary vessels show most age-related damage

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New research suggests that certain areas of the lungs are more likely than others to show age-related damage that compromises respiratory function. The paper is published ahead of print in the *American Journal of Physiology—Lung Cellular and Molecular Physiology*.

Previous studies have found that aging is a well-known factor in the decline of the respiratory system. In the past, studies have focused on the stiffness of the larger arteries in the lungs. Stiffening is associated with reduced function. However, using the extremely high resolution and scanning technology of an atomic force microscope (AFM), researchers are now able to examine changes in lung structure and function (mechanics) on a very small scale, such as the smaller pulmonary blood vessels.

A team of researchers used AFM to measure the level of stiffness of three different areas (anatomical compartments)—blood vessels, airways and lung tissue (parenchyma)—in the lungs of two groups of donors. One group ranged in age from 11 to 30 ("younger"), and the other from 41 to 60 ("older"). The stiffness in both groups varied "significantly across anatomical compartments of the lung, with stiffness being highest in the airways and lowest in the parenchymal regions," the research team wrote. The older group showed consistently higher levels of stiffness in all areas compared to the younger group, confirming that "aging significantly influences the mechanical properties of the vessels and parenchymal tissue."

A better understanding of age-related variability in lung stiffness severity may help scientists develop new treatments for lung disease. "Future efforts to preserve or restore aging- and disease-related loss of lung function will need to take such tissue mechanical and cellular phenotypic changes into account," the researchers wrote.

"Aging and anatomical variations in lung tissue stiffness" was published ahead of print in the *American Journal of Physiology—Lung Cellular and Molecular Physiology*.

More information: Delphine Sicard et al. Aging and Anatomical Variations in Lung Tissue Stiffness, *American Journal of Physiology-Lung Cellular and Molecular Physiology* (2018). DOI: 10.1152/ajplung.00415.2017

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