Lungs of deceased COVID-19 patients show distinctive features

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In a new study in the *New England Journal of Medicine (NEJM)*, senior author, Steven J. Mentzer, MD, thoracic surgeon at Brigham and Women's Hospital, and a team of international researchers examined seven lungs obtained during autopsy from patients who died of COVID-19. They compared this group to seven autopsied lungs obtained from patients who died of acute respiratory distress syndrome secondary to influenza A (H1N1) infection as well as to 10 age-matched uninfected control lungs.

Both COVID-19 and influenza are the same category of virus and both infect the respiratory tract. While the lungs shared some common features, there were distinctive features related to blood vessels seen in the lungs of patients who had died of COVID-19.

Researchers observed that COVID-19 damaged the endothelial cells (vascular lining cells), causing severe endothelial injury. Patients with COVID-19 showed widespread blood clotting as well as new vessel growth—the latter likely a result of the body's response to the virus. The team saw signs of a distinctive pattern of pulmonary vascular disease progression in some cases of COVID-19 compared to that of equally severe influenza virus infection.

Some of the key points are highlighted below:

- COVID-19 is a respiratory virus that causes a vascular disease.
- The damage to vascular cells helps explain the serious blot clotting observed in patients.
- A unique response, intussusceptive angiogenesis (IA), is the way the body compensates for the thrombosis and blood vessel damage.
- Damaged blood vessels may also underlie other problems seen, such as COVID toe, children with Kawasaki, stroke, and other seemingly unrelated problems seen with COVID-19.
- This study shows the need for more research on angiogenesis and the vascular effects of COVID-19.

More information: Maximilian Ackermann et al, Pulmonary Vascular Endothelialitis, Thrombosis, and Angiogenesis in Covid-19, *New England Journal of Medicine* (2020). DOI: 10.1056/NEJMoa2015432

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