

New Study Describes How Clotting Can Be First Sign of COVID-19

A new paper by vascular surgeons at the University of Miami Miller School of Medicine, [published](#) in the *Journal of Vascular Surgery*, describes how thrombosis (blood clots in the circulatory system) was an early indication of infection in a COVID-19 patient.



Thrombosis, shown here as discolorations in the patient's arm and hand, can be a first sign of COVID-19.

Published online on August 21, the paper details how a 67-year-old man, who had no previous medical history, came to the hospital with severe discoloring in his right arm and pain in his hand and forearm. Further investigation showed he had clots in arteries of his arm, generating ischemia (loss of blood flow) that threatened the limb. He soon tested positive for coronavirus.

“This patient had an acute problem with his arm, including pain, numbness and weakness,” said the vascular surgeon and first author on the paper, Tony Shao, M.D., assistant professor of surgery. “That was the main reason he came to the hospital. We found out pretty quickly he had COVID, though he reported only mild respiratory symptoms.”

A first for negative pressure

Dr. Shao and colleagues surgically revascularized the vessels immediately. This was the first time UM vascular surgeons had used the negative pressure surgical suite, which helps prevent viral spread, on a confirmed COVID-positive patient. However, surgery was just the beginning. Though the patient was not having much trouble breathing, his lungs were in bad shape.

“There are COVID patients who clearly look like they're in distress, they're gasping for air,” said UM vascular surgeon and senior corresponding author on the study, Naixin Kang, M.D. “But that wasn't the case here. Looking at his CT scan from when he first came in, you would think he would have a hard time breathing.”

First seen in April, this patient was an early indication to UM doctors that arterial thrombosis can be the presenting symptoms for coronavirus. Other medical groups around the world have made similar observations, though nobody has yet identified precisely how the virus causes these sometimes-deadly blood clots. Many laboratories are currently looking for this mechanism.

“On autopsy studies in patients who died from coronavirus, doctors have found the virus causes micro-thrombosis,

particularly in capillaries of the alveoli (tiny air sacs in the lungs)," Dr. Shao said. However, the blockages described in the study were found in a medium-sized artery.

Though the surgery saved the patient's arm and most of his hand, the coronavirus was not done, and he ended up spending weeks on a ventilator before finally being released from the hospital.

The authors published this case to educate people who see coronavirus purely as a respiratory disease. In particular, clinicians must be alert for COVID-19 infections when patients present with acute limb ischemia and no risk factors.

"People are starting to become aware that COVID does promote hypercoagulability," Dr. Kang said. "We don't know exactly what the mechanism is, but it is now being recognized and studied by different medical societies. While this is certainly a respiratory virus, we need to watch out for excessive clotting."