

Dead tissue-removing larvae star in innovative telehealth procedure

June 1 2020, by Lex Davis



A clinical larva makes its way across a gauze surface. Credit: David Armstrong

David G. Armstrong, DPM, Ph.D., co-director of Keck Medicine of USC's limb salvage program, had a patient with a problem. Post-surgery, the patient had developed necrotic tissue at the site of the wound—according to an AI algorithm, the wound was 46% necrotic. The patient was at an extremely high risk for sepsis, which meant his life was in danger.

Normally such a patient would be sent to a nearby emergency department with all due speed, but the coronavirus pandemic

complicated that. Patients with slow-healing wounds often have comorbidities that increase the likelihood that a COVID-19 infection will become fatal; in this case, the patient had diabetes. The patient also had suffered repeated bouts of pneumonia in the past and was in fact struggling with a case of pneumonia at the time.

Armstrong, who is also professor of clinical surgery at the Keck School of Medicine of USC, needed to debride the dead [tissue](#), and he needed to do so without bringing the patient into a [hospital setting](#). For the debridement, he turned to "nature's microsurgeons," otherwise known as *lucilia sericata*, the larvae of the common green bottle fly. Armstrong has worked with *l. sericata* for more than 25 years and noted that they do a thorough job of clearing dead tissue without harming live tissue. An added benefit is that the process is painless for the patient. "They do a great job, you don't have to tell them what to do, and they work 24/7," he remarked.

While one might expect a visceral objection on the part of the patient, Armstrong explained that this was not the case. "It somehow draws them in. People actually light up. Most people have read about using maggots and leeches and they're curious."

Armstrong had debrided [necrotic tissue](#) with maggots hundreds of times before. What he had not done was oversee such a procedure via telemedicine. Armstrong arranged for a courier delivery of specially bred, disinfected medical-grade *l. sericata*, and in a 20-minute video chat he guided the patient's home care nurse in applying the larvae and rolling on a stocking-like dressing. Two days later, he needed just a 15-minute video chat to help the nurse change the dressing. The success was remarkable: After two days, the necrotic tissue had gone from 46% of the total surface area to 14%. Another three-day application brought the [dead tissue](#) down to less than 1%.

The team believes this is the first time telemedicine has ever been used for such a procedure. Armstrong expects that this is just the start of what will soon be an explosion of innovative telemedicine use: "This has a huge potential to make sure we're making thoughtful use of hospital resources while increasing the patient's access to care and offering them a better quality of life."

Provided by University of Southern California

Citation: Dead tissue-removing larvae star in innovative telehealth procedure (2020, June 1) retrieved 23 April 2024 from <https://medicalxpress.com/news/2020-06-dead-tissue-removing-larvae-star-telehealth.html>

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