

## Once Upon a Time: Vascular Surgery and COVID-19

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### Abstract

Humanity is fighting the most severe health crisis in its history since the Spanish flu nearly 100 years ago. Indeed, COVID-19 has affected more than 14,000,000 patients and more than 590,000 have died worldwide. Remote consultation and telemedicine were highly developed during this period of COVID-19. In contrast, all elective activity dropped drastically. This brief communication summarizes our experience during this health crisis and looks to the future in the presence of the beginnings of a second wave of COVID-19 infection.

**Keywords:** Vascular surgery; COVID-19; SARS-CoV-2

### Short Communication

Humanity is fighting the most severe health crisis in its history since the Spanish flu nearly 100 years ago. Indeed, the World Health Organization has considered the outbreak of severe acute respiratory syndrome due to coronavirus 2 [SARS-CoV-2] as a global pandemic affecting more than 200 countries [1]. Until July 20th 2020, the number of patients infected with coronavirus exceeded 14,000,000 and the number of deaths exceeded 590,000 [2].

Given the large number of patients requiring a long intensive care unit stay in a short period of time, the vast majority of health facilities were quickly overwhelmed. In this context of tension, vascular surgeons have sharply reduced their elective activity, first by delaying and then cancelling outpatient clinics and operation appointments.

Whilst, some vascular surgery departments operate on urgent patients such as the chronic limb-threatening ischemia, symptomatic carotid stenosis, and aortic aneurysm >5.5 cm [3], other departments have considered levels of priority; level 1 routine admission for operation especially stable patient with aneurysmal vascular disease, patient with intermittent

claudication or arteriovenous fistula and graft placement for dialysis. Level 2 is urgent surgery like thoracoabdominal aneurysm [TAAA]/abdominal aortic aneurysm [AAA] with acute contained rupture, symptomatic peripheral aneurysm, symptomatic mesenteric ischemia or infected access for dialysis. Level 3 is emergency like TAAA/AAA and peripheral aneurysm with rupture in haemodynamically instable patients, acute limb ischemia with neurologic deficit of the limb, complicated type B aortic dissection and traumatic injury with hemorrhage. And finally level 4, which is salvage operation for patient requiring cardiopulmonary resuscitation en route to operation room or before induction of anesthesia [4].

Our practice as vascular surgeons has significantly changed since the beginning of the COVID-19 pandemic. There has been an increase in the number of veno-venous extracorporeal membrane oxygenation [ECMO] primarily for acute respiratory distress syndrome [ARDS] or pulmonary embolism and of veno-arterial ECMO for myocarditis in COVID-19 positive patients. Arterial thrombosis also represented a significant part of daily practice. In fact, clinical manifestations were often related to aorto-iliac and mesenteric occlusions. Finally, there was an increase in the severity of peripheral arterial disease with a consequent rise in the number of amputations in some vascular surgery departments [5].

There has, paradoxically, been a decrease in the number of patients in emergency departments. This is thought to be related to the fear of some patients of being infected with coronavirus in medical establishments. According to El-Hamamsy et al there was a significant and precipitous drop in the monthly surgical case volume of acute type A aortic dissection from  $12.8 \pm 4.6$  cases/month before-COVID-19 to  $3.0 \pm 1.0$  cases/month after-COVID-19, representing a 76.5% decrease in volume. This low volume concerns 2 consecutive months [March and April 2020] in New-York City [NYC]. At the same time, the number of at-home deaths in NYC have reached an 8- to 10-fold increase compared to the same time period in 2019, raising concerns about the impact of the pandemic on non-COVID-19 related health conditions [6].

Coronavirus is highly contagious. Frequent hand washing and personal protective equipment [PPE] such as caps, masks, gowns and over-shoes are essential to reduce the risk of contamination of caregivers. Unfortunately, many doctors and nurses were infected and even died. In fact, many hospitals and countries struggle with shortages of drugs, ventilators, and PPE, putting both patients and staff at risk. For this reason, all patients undergoing elective surgery should be screened prior to surgery and all patients undergoing emergent/urgent surgery should be considered COVID-positive until proven otherwise. The effects of the COVID-19 health emergency will probably persist long after the peak of the pandemic has passed, especially in specialties such as vascular surgery; the majority of our patients are at high risk of COVID-19 related mortality [7].

Residents as well as fellows who have been surgically on standby and who have been actively involved in resuscitation care in COVID-19 units throughout the pandemic period should resume their training and education programs. In fact, many institutions have been teaching their vascular fellows and residents about ventilators, respiratory therapy, intubations, and triaging patients. They can also perform many bedside procedures for critically ill patients such as placement of central intravenous catheters and temporary vascular access [8].

In view of the improving figures of confirmed cases and deaths related to COVID-19 in the USA and Europe, hospitals are preparing for the resumption of elective surgery. Research shows that patients have many questions and specific uncertainties about the safety of undergoing elective operations in hospitals, regardless of whether COVID-19 patients are being concurrently treated in the same facility. That's why the American College of Surgeons has published the post-COVID-19 readiness checklist for resuming surgery.

This checklist contains core facility items and surgery-specific ones [9].

The theory of a second wave of Covid-19-positive patients such as humanity had with the Spanish flu has not been dismissed, despite the long lock-down that more than a third of the world's population has endured. The hypothesis of the discovery of a vaccine in the immediate future is also not current. Humanity must therefore adapt and live with the coronavirus while waiting for better days.

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