

COVID-19 and vascular surgery at a central London teaching hospital

Editor

The COVID-19 pandemic has undoubtedly had a profound effect on surgical practice globally, with changes that encompass service delivery and structure, human resourcing, intensive-care (ICU) capacity, operative case selection and outcomes, as well as the nature of surgical presentations themselves¹⁻³. The UK nationwide lockdown commenced on 23 March 2020 and heralded significant changes to the vascular practice of our unit, which provides care to the population of north-west London and functions as a national referral service for complex aortic and deep venous pathologies.

We recognized the importance of early initiation of audit in order to better inform our practice going forward during this crisis and present the results here. We evaluated case type and distribution, timings (time from admission to intervention, and length of stay), COVID mortality, and non-COVID mortality, spanning the period 2 March to 4 May 2020. This time period therefore includes patients treated in the 3-week period prior to the lockdown, and 6 weeks following start of lockdown. We included all patients who were formally under the care of the Vascular Unit, as well as patients under other clinical teams who had documented regular vascular involvement, across the hub hospital and its affiliated spoke hospitals. These patients ($n = 123$) were further subdivided into those who received open or endovascular procedures within that timeframe ($n = 91$), and those who were managed nonoperatively ($n = 32$). Varicose vein interventions are not included; these were stopped from 16 March 2020. We observed a sharp reduction in the total number of procedures performed following the lockdown ($n = 42$ over 6 weeks), compared to pre-lockdown ($n = 64$ over 3 weeks), noting that 11 patients had 2 or more interventions.

There was also a reduction in the emergency/urgent work-load post-lockdown ($n = 42$ procedures, mean 7 per week), compared to pre-lockdown ($n = 46$, 15 per week). Across the spectrum of vascular disease, there were reductions in the number of operations for all pathologies, with the exception of acute limb ischaemia where we observed a slight increase following lockdown (7 procedures post-lockdown, 4 pre-lockdown), and carotid endarterectomy (CEA) where parity was maintained. Following lockdown, two CEAs (symptomatic carotid disease (<14 days from symptoms) and four EVAR (aneurysms >7 cm) were performed on COVID-negative patients at an affiliated private institution, which was designated as the COVID-free site for urgent major arterial surgery. One type III thoracoabdominal aneurysm repair was performed for a symptomatic mycotic aneurysm at the hub hospital. Importantly, no procedures were performed following lockdown for non-urgent pathologies, including procedures for intermittent claudication or chronic venous insufficiency. For all procedures, the time from admission to surgery was reduced from a mean of 3.8 days pre-lockdown to 2.4 days post-lockdown.

Of the 32 patients in the nonoperative group, 13 were recovering from a procedure performed prior to 2 March 2020 and the remaining 19 received no open surgical or endovascular intervention during the current admission. Indications for admission were as follows: palliation ($n = 3$), re-admission for management of postoperative complications ($n = 2$), work-up ahead of urgent AAA repair ($n = 1$), graft infection ($n = 1$), critical limb ischaemia ($n = 3$), cancelled elective surgery ($n = 2$: one open aneurysm repair cancelled due to lack of critical care bed, and one digit amputation no longer required), arterial thrombosis ($n = 5$), and venous thrombosis ($n = 2$).



There were 13 COVID diagnoses in the operatively managed group. Two were diagnosed preoperatively and 11 postoperatively. Of these 13 patients, seven succumbed to the virus (mean age

74 years, three males, four females, five BAME background, two Caucasian), giving a case-fatality rate of 54 per cent. Only one of these fatalities had spent time on an ICU. Five of the seven were classified as having had their vascular issue resolved, whilst two had non-resolved vascular pathology. There were nine COVID diagnoses in the nonoperative group, four of which died from COVID-related disease (mean age 75 years, three males, one female, all Caucasian), giving a case-fatality rate of 44 per cent. Only one of these patients was classified as having had their vascular issue resolved. In both the operatively and nonoperatively managed groups, all patients classified as COVID+ve and vascular 'non-resolved' died.

Clearly, the data are limited by small numbers, precluding any meaningful statistical analysis. It does, however, reflect the stark reality of the situation with respect to our vascular patient population. The data are also contemporaneous, given that the audit cycle closed on 4 May 2020, less than 1 week prior to write-up. In keeping with other published reports on vascular surgery during the pandemic, our surgical activity is restricted to vascular emergencies and urgent cases, and we have preferentially used endovascular interventions where possible⁴⁻⁶. Furthermore, we have also noted an overall decline in emergent referrals^{4,6,7}. Although limited by small numbers, the high mortality attached to vascular procedures performed on patients who are either preoperatively COVID+ve, or subsequently become COVID+ve, ought to prompt aggressive and early testing for the SARS-CoV-2 virus in vascular patients to aid consent and treatment decisions, bearing in mind patient's other co-morbidities. Of concern in this small series is the finding that COVID+ve patients with unresolved vascular problems had all died. There is a clear need to contribute to ongoing collaborative efforts to capture, analyse and share data in order to understand the impact of this condition on our vascular patients. The Vascular and Endovascular Research Network COVER study (<https://vascular-research.net/projects/>

cover-study-covid-19-vascular-service-study/) seeks to provide invaluable insights into this disease with regard to vascular patients. The outcomes of those both with and without a diagnosis of COVID may be a reflection of what is clearly emerging as the wider health effects of the COVID pandemic including, but certainly not limited to, delays in presentation, diagnosis and management related to the pandemic period⁸.

Yours sincerely,

A. Rolls , A. Sudarsanam, X. Luo, C. Aylwin, C. D. Bicknell, A. H. Davies, R. G. J. Gibbs, U. Jaffer, M. P. Jenkins, D. Nott, C. V. Riga, J. Shalhoub , G. Sritharan and N. J. Standfield
Imperial Vascular Unit, St. Mary's Hospital, London, UK

DOI: 10.1002/bjs.11765

- 1 Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. *Br J Surg* 2020; **107**: 785–787.
- 2 Vogler SA, Lightner AL. Rethinking how we care for our patients in a time of social distancing during the COVID-19 pandemic. *Br J Surg* 2020; **107**: 937–939.
- 3 COVIDSurg Collaborative. Global guidance for surgical care during the COVID-19 pandemic. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11646> [Epub ahead of print].
- 4 Ben Abdallah I, Coscas R, Javerliat I, Goëau-Brissonière O, Coggia M, Pellenc Q *et al*. Early Experience in Paris with the Impact of the Covid-19 Pandemic on Vascular Surgery. *J Vasc Surg* 2020; doi: 10.1016/j.jvs.2020.04.467 [Epub ahead of print].
- 5 Ünal EU, Mavioglu HL, İscan HZ. Vascular surgery in the COVID-19 pandemic. *J Vasc Surg* 2020; doi: 10.1016/j.jvs.2020.04.480 [Epub ahead of print].
- 6 Gouveia e Melo R, Pedro LM. Vascular surgery department adjustments in the era of the COVID-19 pandemic. *J Vasc Surg* 2020; doi: 10.1016/j.jvs.2020.04.017 [Epub ahead of print].
- 7 Mellissano G, Mascia D, Baccellieru D, Kahlberg A, Bertoglio L, Rinaldi E, Chiesa R. Pattern of Vascular Disease in Lombardia (Italy) during the first month of the COVID-19 outbreak. *J Vasc Surg* 2020; doi: 10.1016/j.jvs.2020.04.481 [Epub ahead of print].
- 8 Douglas M, Katikireddi SV, Taulbut M, McKee M, McCartney G. Mitigating the wider health effects of COVID-19 pandemic response. *Br Med J* 2020; doi: 10.1136/bmj.m1557 [Epub ahead of print].