

EDITORIAL

COVID-19 and vascular care: a tale of sorrow, relationships and evolution

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The catastrophic effects of the coronavirus pandemic in the UK have been well documented, with a reported death toll exceeding 160,000¹ and a crippling impact on healthcare provision and resources.² Vascular services were not immune to the impact of the pandemic, and in an attempt to better understand this, the Vascular and Endovascular Research Network (VERN) established the COVID-19 Vascular SERvice (COVER) study.^{3,4} Supported by global stakeholders and funded by the Circulation Foundation, the COVER study opened to recruitment in March 2020, taking just 14 days from conception to full ethical approval. The study documented the impact of the coronavirus pandemic on vascular services, patient outcomes and decision making through to April 2021. A fall in elective open aneurysm surgery, postponement of chronic limb threatening ischaemia (CLTI) interventions and the suspension of face-to-face clinics and MDT meetings were some of the observed findings.⁵⁻⁷ There was a clear focus on protecting patients and staff by attempting to minimise exposure and cross-infection whilst accommodating pandemic-related pressure on healthcare resources. This was supported by timely guidance from organisations such as the Vascular Society of Great Britain and Ireland (VSGBI).⁸

Whilst prophylactic and elective services were reduced or suspended, urgent or emergency procedures were forced to continue in the face of reduced capacity and support. There was a natural concern amongst the workforce that these modifications to practice and the scarcity of resources might lead to adverse patient outcomes. The Tier 2 component of the COVER study⁹ captured short- and long-term outcomes of these interventions. Over a three-month period, across a global population of 1,103 patients, the COVER study found an in-hospital mortality of

11% for all interventions. Aortic interventions reached a 15% mortality, irrespective of mode or type of repair (endovascular or open), symptomatic carotid intervention mortality was 10.7%, with a combined stroke or death rate of 13.6%. These figures were far higher than previously reported and may not have been completely attributable to positive SARS-CoV-2 infection alone as only 4% of the cohort had proven infection. However testing protocols were highly variable at that time. Perhaps we were witnessing the second-order mortality effects of healthcare within a pandemic?

These procedural outcomes, whilst concerning, were perhaps inescapable. The severity of disease in these cases was significant, necessitating intervention for conditions such as severe CLTI, acute limb ischaemia and symptomatic aortic conditions. This cohort was therefore an inherently higher risk patient group.

Another area of concern were those patients not offered an intervention due to the resource pressures. Tier 3 of the COVER study evaluated the decision making over a one-month period. 1,800 patients were studied across 52 centres in 19 countries. CLTI (28.8%), diabetic foot complications (13.1%) and acute limb ischemia (12.5%) made up the top three presenting conditions. There was an overall shift in management plans towards delay, best medical therapy, or amputation in around a fifth of all presentations, the consequences of which are the subject of ongoing studies.

Away from the adverse effects of the pandemic on vascular surgery outcomes there was a transformation in the relationships between societies, nations and practitioners. The COVER study is one of the many global collaborations designed to produce rapid, real-time information to help guide and inform practice in a contemporaneous manner. Networking between

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worldwide vascular communities was paramount and is ongoing. The vascular surgery coronavirus collaborative (VASCC) is studying coronavirus associated vascular thrombosis and its management globally,¹⁰ whilst the COVIDsurg collaborative is informing healthcare practitioners with respect to vaccination.¹¹ Many other allied disciplines have shared their experiences or adaptations. Single centre experience from Scotland¹² reported updates to vascular technology laboratory protocols, enabling triaging of the most urgent imaging and providing guidance regarding appropriate personal protective equipment (PPE). This, alongside national guidelines released by the Society of Vascular Ultrasound (USA), both of which advise on education and training, are valuable resources for current and future pandemics. Interventional Radiology colleagues in Canada demonstrated a fall in elective interventions whilst maintaining emergency or urgent intervention¹³ and shared learning with respect to PPE policy, triage and consultant-led operating, all of which was achieved through collaborative research. It is clear that collaborative research has grown exponentially over the past two years with a rapid increase in the number of collaboratives and recognition of this research model by a number of leading medical journals.

Throughout the pandemic, web-based methods have become a revolutionary tool in the delivery of up-to-date vascular education. Initial educational efforts at the beginning of the pandemic hinged around the dissemination of contemporary research and practices to a global audience. With the suspension of face-to-face meetings and teaching, it became critical for the vascular community to rapidly evolve the way it delivered professional development and education. Several virtual meetings were held with a great deal of interest from global audiences.¹⁴ The virtual format facilitated engagement of international speakers and delegates with minimal travel and perhaps increased the reach of such meetings without the damaging effect of a carbon footprint. The VSGBI, in partnership with the British Society of Endovascular Therapy (BSET) and the Rouleaux Club (RC), were able to deliver a comprehensive educational series over 2020 and 2021 to meet the educational rigours of the vascular curriculum. Expert faculty were able to convene and deliver high quality, up to the minute educational material, a model replicated across the globe.¹⁵ Feedback from trainees was hugely positive and attendance was recognised in trainee portfolio assessment. Development and delivery of these programs resulted from the motivation of a few individuals who should be congratulated. The expanse of virtual and online learning was unprecedented, but concerns were raised regarding a healthy work-life balance as much of the virtual education and conferencing happened 'out-of-hours'.

While theoretical education is important and evidence-based decision making underpins much of day-to-day practise within a specialty such as vascular surgery, the need for developing and refining craft skills is essential. The RC developed and delivered training workshops for medical students and junior trainees, using home-made equipment with online supervision. This remarkable

and innovative training model ensured a level of accessibility to aspiring vascular surgeons, helping to safeguard the future vascular workforce. The evaluation of the impact of the pandemic on vascular training is paramount. Several guidelines promoted consultant operating which, together with reduced case numbers, significantly restricted training opportunities. A UK wide analysis of all surgeons in training demonstrated a fall in log book numbers across all specialties, with emergency specialties being the least affected. Vascular surgery trainees witnessed a 40% fall in elective, but only a 5-10% fall in emergency procedure training opportunities. This equates to a concerning 30% reduction in overall operative training. Annual Review of Competency Progression (ARCP) outcomes were also significantly affected with 20% of trainees receiving an outcome of 10 (requiring further time for training), a worrying statistic given the current shortage of consultant surgeons¹⁶ and the demanding post-pandemic recovery plans.

Clinical practice has evolved by necessity during the pandemic. Remote follow up often using innovative technology (virtual or telephone clinics), electronic record keeping (including wound progress images) and e-referral systems have all become common place.^{17,18} Home-based exercise technology has the potential to optimise non-interventional management and enhance post-procedural recovery.^{19,20}

The COVID-19 pandemic has had a profound, wide reaching impact on vascular surgery services worldwide, affecting all aspects of care. This has challenged many of the processes that we take for granted from education through to intervention delivery, peri-procedural care and workforce retention. The vascular community has demonstrated a desire and determination to maintain high quality standards and outcomes in the face of adversity. The adaptation of vascular registries,²¹ improvement of online education and evolution of current services have been rapidly and dynamically adopted. COVID-19 will have ongoing and far reaching implications for the vascular community but, if we remain tenacious and flexible, we will continue to offer safe and effective vascular services which are responsive to the challenges ahead.

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