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Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

Hypercoagulability following COVID-19 infection: at what stage is it safe to do a free flap?

The number of patients with COVID-19 is exhibiting a constant increase.[1,2] This pandemic has resulted in new challenges for clinical teams. There is emerging evidence that the current crisis is affecting the management of head and neck cancer (HNC) patients. Clinicians worldwide face this new severe infectious lung disease with limited therapies. In some units the service of head and neck cancer-related surgery has been cancelled or at least delayed. The demand for maintaining intensive care unit (ICU) availability has affected surgeries with reconstruction when free tissue transfer is required. Protocols and guidance regarding the management of cancer have been published by the relevant associations.[3,4] As part of the preoperative investigations, antigen / PCR testing has been added for all HNC patients due to the increased risk of morbidity and mortality to both patients and clinicians. Health systems around the world are gradually starting to have empty ICU beds and clinicians will soon start to think about free tissue transfer operations for suitable patients. COVID-19 disease is now so widespread that some patients will have tested positive before their surgical intervention. Inevitably, their operation will have been cancelled and re-scheduled for some time in the future. Head and neck reconstructive surgeons will need to balance potential cancer progression with adequate recovery from the COVID-19 disease in order to ensure successful outcome, in terms of cancer survival and functional reconstruction. This is both ethically and oncologically an emerging problem, facing the health systems all around the world.

COVID-19 is a systemic infection associated with significant haematological derangement. Specifically, data indicates a hypercoagulability together with a severe inflammatory state.[5] Elevated D-Dimer levels are frequently reported; elevated D-dimer at admission and an increasing trend during the course of COVID-19 illness, predicts development of acute respiratory distress syndrome (ARDS), ICU admission and mortality.[6,7] Other coagulation abnormalities include prothrombin time (PT) and activated partial thromboplastin time (APTT) prolongation, increased fibrin degradation products and, less commonly, disseminated intravascular coagulation (DIC).[8] D-dimer elevation may also occur in asymptomatic individuals testing positive for COVID-19,[9] possibly representing a subclinical hypercoagulable state. Free-tissue transfer has become routine surgery, and this may be attributed to the development of instruments and techniques as well as training. The incidence of microvascular thrombosis leading to free-flap failure is relatively low; however, anastomotic thrombosis can still occur despite the best of circumstances. Most of the time anastomotic failure is due to a technical issue but can also occur due to hypercoagulability states. In order for reconstructive surgery with free-tissue transfer to proceed in a patient with a recent history of COVID-19, or an incidental positive PCR test, further specific tests are advisable. These should include PT, APTT, fibrinogen, and D-Dimer. There is evidence to support the value of baseline D-dimer in predicting initial venous thromboembolism (VTE) in asymptomatic individuals, and the use of D-dimer to predict risk of recurrent VTE after stopping anticoagulation following a VTE.[10,11] Therefore D-dimer may yet have a role predicting risk of thrombotic events in free flap patients. In those cases where the D-dimer is elevated, extensive surgery may need to be delayed or the reconstruction modified, although at present more work is required to identify a numerical cut-off. Regarding prophylactic anticoagulation for either microvascular or venous thrombosis, existing protocols relating to the management of thromboembolic complications of COVID-19 do not address the patients undergoing free flap transfer.[12] Further data is therefore required in order to assess the need of the type of drug, dosage and optimal duration of prophylaxis.

At present we do not have robust data with which to make recommendations. Every patient needing reconstruction with a free flap requires careful assessment by the clinical team.

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In addition to the haematological testing, patient counselling and initiation of deep venous thromboembolism prophylaxis measures are critical clinical components of care. The clinical team needs to reassess the patients' performance status following COVID-19. Whilst most people recover from pneumonia without any lasting lung damage, the pneumonia associated with COVID-19 causes lung injury with breathing difficulties in certain patients, which takes months to improve. Taking into account the above, it may be appropriate, in specific cases, to consider delayed reconstruction.

Conflict of interest

We have no conflicts of interest.

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