

The RoboticScope can be a Useful Tool for Hand and Microsurgical Procedures during the COVID-19 Pandemic

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During the COVID-19 pandemic, practice of hand surgery as well as other surgical specialties has been strongly conditioned. Specific pathways have been created for COVID-19 patients, and surgical activities changed, focusing resources on the treatment of emergency and urgent procedures.¹

The survey “COVID-19: initial experience of an international group of hand surgeons,” recently published in *Hand Surgery and Rehabilitation*, showed that during the COVID-19 pandemic, most surgeons continued to operate all kinds of emergencies, amputations, revascularizations, replantations, and deep lacerations including tendons, muscles and nerves.²

Adequate personal protective equipment (PPE) is mandatory during surgical procedures on suspected or confirmed positive COVID-19 patients. As previously reported, a case of COVID-19 in a hand surgeon occurred because protective measures against viral transmission were not correctly observed.³

At present, for suspected and/or COVID-19 patients undergoing aerosol-generating procedures (high-speed power tools such as saws or burrs, drill, jet lavage systems, and electrocautery), surgical helmets or facial shield, FFP2-FFP3 N95-N99 surgical masks, double gloves, and level 3 to 4 surgical gowns are recommended.⁴

In clinical practice, some PPE including surgical helmets and facial shield may prevent the use of magnification surgical loupes and operating microscope in hand surgery. In our experience, during the 3 months of the COVID-19 pandemic (March–June 2020), we operated three patients

positive for SARS-CoV-2. Fortunately, only one out of three patients required a microsurgical procedure for digital nerve repair and flexor tendons suture, which was performed with clip-on low-magnification lens worn under surgical helmet. Nonetheless, in case of microsurgical or microvascular procedures requiring operating microscope, the problem of personal protection of hand surgeons is still unsolved.

Recently, a new type of operating microscope named RoboticScope (BHS Technologies GmbH, Innsbruck, Austria) has been introduced in the market. During surgical procedures, the surgeon can remain at a controlled distance from the microscope using a head-mounted display (HMD) (► **Fig. 1**). The HMD allows the surgeon to view images from the microscope camera. A modification of head-mounted support has been performed as per the request of the Senior Author (BB) to use HMD under surgical helmets and/or facial shield (► **Fig. 2**). The HMD recognizes the surgeon's head movements and changes the position of the 3D camera accordingly. In this way, the surgeon only has to move his head to always have an optimal view of the operating field, and his hands can always remain on the patient.

We tried and practiced with this equipment in our laboratory with growing confidence and results. Based on our personal experience, we believe that this type of microscopes could be a useful tool to consider with regard to microsurgical procedures in selected cases such as suspected or COVID-19 positive patients.



Fig. 1 RoboticScope in use.



Fig. 2 Head-mounted display under surgical helmet.

Conflict of Interest

None declared.

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