platforms such as those provided by BAPRAS may provide with regards global connectivity, real-time interactive exchanges, lack of expense and relative convenience. The concept of easier access to 'world-class' surgeons is a significant advantage of the use of remote technology and is a prospect which excites us as trainees and we agree this has the potential to benefit trainees across all specialities.

However we feel that certain areas could be explored further such as the use of virtual reality (VR), augmented reality (AR) and haptic technology in helping to bridge the gap between online education and practical skills. The Royal College of Surgeons (RCS) Future of Surgery project has identified these technological platforms as key for the transformation of surgery over the coming years.[2] Both VR and AR are already being utilised by surgeons to train and rehearse surgical procedures enhancing training and improving access across the global surgical community.[3,4]

The authors suggest that it is not feasible for surgeons in training to obtain necessary skills without 'hands-on' practical experience. Conversely literature supports the use of both VR and AR in surgical training with positive outcomes with regards to the speed of acquisition of new skills and the ability to perform procedures accurately.[5] Of course virtual teaching in any of its guises is not trying to take away or replace 'hands-on' practical experience and nor should it. We feel that such technologies provide an invaluable resource for developing skills, and now in the current pandemic, more so than ever, are necessary though not sufficient for trainees to gain appropriate expertise. Whilst hands-on experience is clearly an essential component of a surgeon's training, technological platforms incorporating practical experiences, even if artificial, are an asset which should be further considered as surgical training evolves to help bridge the gap between theory and practice. It is important to recognise roles of different educational resources and the RCS Future project is looking at all the different elements of the plastic surgery curriculum including how best to deliver them and we welcome this evolution of surgical training.

Lastly we were impressed by the authors' consideration for security and in particular found their points raised about consent quite thought-provoking. This is something that is on the forefront of our minds as trainees given the medico-legal cases revolving around consent. We are in agreement that the consent process needs to be adapted and in fact we would go further and suggest looking at the general data protection regulations (GDPR) guidelines and look to integrate those into obtained consent. Neither of the authors have considered the importance of the explicit consent that would be needed to facilitate live streaming, recorded webinars or even patient details incorporated into other technological platforms, and this is something we as health professionals would be judicious to consider at the earliest possible stage.

Declaration of Competing Interest

The authors confirm that they have no conflicts of interest to declare.

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Gary Masterton
St George's Hospital, United Kingdom

Alexander Zargaran
St Thomas' Hospital, United Kingdom

David Zargaran
Royal Free Hospital, United Kingdom
E-mail address: alexander.zargaran@gstt.nhs.uk (A. Zargaran)

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Optimizing intraoral surgery video recording for residents' training during the COVID-19 pandemic: Comparison of 3 point of views using a GoPro

Dear Sir,

The COVID-19 pandemic has been an extremely challenging time for health workers worldwide. Even though

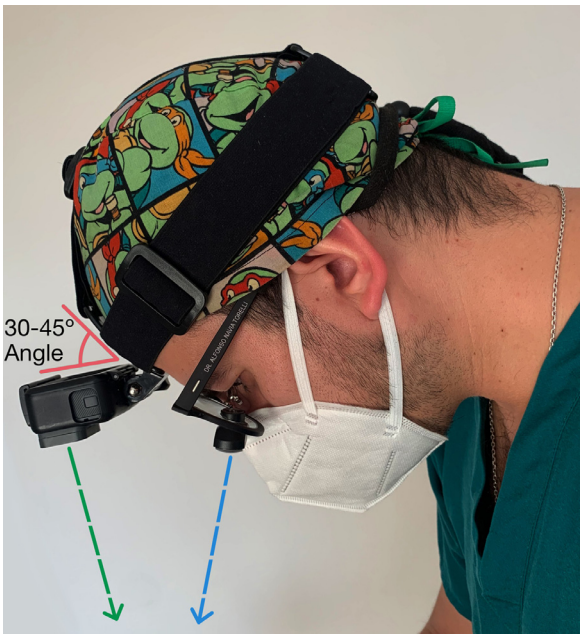

Figure 1 GoPro attached with a head-strap with an approximate angle of 30°-45° to assure optimal recording.

some non-surgical specialties have seen a greater demand in their duties, surgical specialties have shown a significant decline in their activity, focusing mainly on emergencies. Plastic and Maxillofacial surgeons have been especially impacted, not only because of their high percentage of elective surgeries being suspended, but also because they are subject to an increased risk of virus exposure during intraoral surgeries. This has consequently affected residents' surgical training programs with modifications to their rotations and even temporarily redeployment to other areas. In this sense, means of distant teaching like simulation training and webinars have been of increased interest to keep – to some extent – residents' training.[1]

Intraoperative video recordings and live surgery broadcastings have been already explored in literature as ways to improve residents' education. The use of GoPro cameras (GoPro Inc., California, US) in surgical residents' feedback has shown to be an excellent tool for dynamic education, leading to potential enhancement of technical skills.[2] Some authors have even proposed modifications in order to correct shortbacks like magnification and battery life.[3] Recording videos in intraoral surgery represents a greater challenge due to the depth of the oral cavity and the reduced work space. In this study we compared video recordings in palatal closure surgeries from three different point of views (POVs).

The camera used was a GoPro Hero 7 Black (GPH7B). The GPH7B includes a touchscreen and offers high-quality video recording up to 4 K with 60 frames per second (FPS), voice command controls and is waterproof down to 10 m deep. It also allows 720p live video broadcasting and offers up to 90 min of continuous video recording. Settings used for our study were 720p, 60 FPS and narrow field of view in order to optimize battery duration. The POVs used were: with a head-strap by the First Surgeon (FS); with a head-strap by the First Assistant (FA) and Hand-held by the First or Second Assistant (HH) after an aseptization process of the camera consisting in a 5 min bath in a 10% povidone-iodine solution (taking advantage of the camera's waterproof properties) followed by rinsing off the povidone with sterile water or saline solution, drying the camera with sterile gauze pads and wrapping it in sterile Tegaderm (3 M Enterprise, Minnesota, US) keeping a frontal opening for the lens. When using the head-strap, the camera was tilted in a 30°-45° angle in order to get the most adequately framed image (Figure 1). Voice control commands were used in order to optimize recordings and battery times while keeping surgeons scrubbed in when using the head-mounted camera. No frontal lights were used.

Comparisons of the three POVs can be seen in Supplementary Video 1. In our experience, the quality of video recordings were better when used by the FS and the HH methods (Figure 2). The latter has the disadvantage of occupying one of the assistant's hands, however it offers a unique advantage by being able to record videos practically inside the mouth. Regarding the safety of this innovative method, a previous study by Purnell et al. reported their

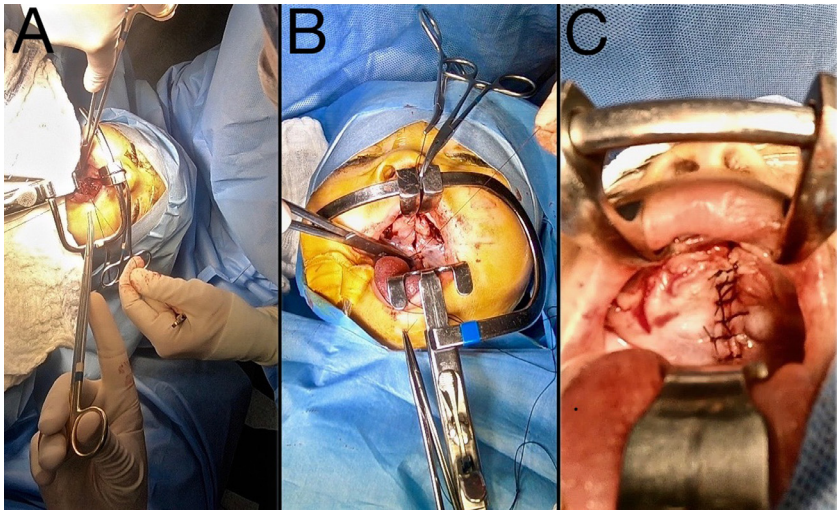

Figure 2 Photographic comparison of the three point of views using the GoPro camera: (A) first-assistant, (B) first surgeon and (C) hand-held.

9-year experience in more than 2000 cases with the use of a waterproof camera previously immersed in 10% povidone-iodine (diluted 1:25 in sterile water) without increasing the risk of infection or contamination, not only in intraoral surgeries (clean-contaminated wounds) but also in clean procedures like cranioplasties.[4] Another device reported to be adapted for POV recording is the use of a head-mounted smartphone, however the entire assembly had a weight of almost 300 g compared to the 117 g of the GPH7B which could increase strain during long procedures.[5] The use of video-recording glasses has also been published, being a comparable POV to the FS head-mounted GPH7B, but still poses the same disadvantages when compared to the HH in terms of the versatility of having an aseptisized camera in the operating table.

Some surgeons prefer using the operating microscope for intraoral surgeries like cleft palate repair, allowing high-resolution video recording, however this is not available in all centers, especially those of developing countries. In terms of costs, the GPH7B has a current price of US $329.99 and the head strap US $19.99 (www.gopro.com), which is reasonable considering the costs of other commercially available intraoperative surgeon POV recording systems.

During these difficult times, alternatives must be explored in order to maintain residents' training within possible. Optimal intraoral surgical video recordings can be obtained with the use of a GPH7B camera, especially by aseptisizing it with iodine-povidone, offering a reproducible, safe and low-cost method to improve residents' training during the pandemic.

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Ethical approval

All procedures performed involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Pictures and videos of patients have parent's signed consent for publication.

Author contribution

All authors participated in the development, writing and revision of this article.

Declaration of Competing Interest

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2020.10.068.

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Alfonso Navia
Section of Plastic and Reconstructive Surgery, Surgery Division, School of Medicine, Pontificia Universidad Católica de Chile, Diagonal Paraguay 362, Santiago 8330024, Chile

Leonardo Parada
Department of Plastic Surgery, Hospital Luis Calvo Mackenna, Santiago, Chile
Department of Plastic Surgery and Burns, Hospital del Trabajador de Santiago, Santiago, Chile

Gloria Urbina, Claudia Vidal, Carmen Gloria Morovic
Department of Plastic Surgery, Hospital Luis Calvo Mackenna, Santiago, Chile
E-mail address: ajnavia@uc.cl (A. Navia)

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Management and outcomes of mammalian bite injuries during COVID-19 and implications for future practice

Dear Sir,

Mammalian bite injuries account for a large number of attendances to emergency departments and approximately 7000 hospital admissions annually in England.[1] There are no