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SAGE

VITOM® 3D system in surgeon microsurgical vascular training: our model and experience

Dear Editor,

Optical magnification is an essential tool in the practice of vascular surgery as it allows to accurately identify and define critical anatomic structures, reducing complication rates (1). Loupes with ×2.5-×4.5 magnification are most frequently used, although, in some circumstances, the operating microscope may be used (2, 3). These magnifying instruments are essential to the optimal care of our patients but they often come at the detriment of the operating surgeon in the form of neck or back pain and fatigue (4). Recent advances in imaging technology have led to the development of a high-definition (HD) compact video microscope to perform open surgery that requires magnification. The exoscope VITOM® HD 3D system provides images of superb quality, 2-16 times magnification zoom and good illumination displayed on large-format 3D-HD flat screen for viewing by the surgeon, assistants and other operating room personnel. VITOM® HD 3D system uses VERSACRANE™ that is an autostatic arm, spring-loaded and quick-acting (Fig. 1A). The most important functions are controlled via the IMAGE1 PILOT, mounted in direct vicinity of the surgeon (Fig. 1B). VITOM® has been used extensively in neurosurgery and in one study was found to be equivalent to and a much less expensive substitute for the traditional operating microscope (5). This study aimed to apply the VITOM® as a potential substitute for loupes in order to create microsurgical vascular anastomoses and to assess it as an effective intraoperative teaching modality for open surgical cases.

Three surgeons (one expert and two mid-level surgical residents) used the VITOM® HD 3D system on a series of 20 arterio-venous fistula (AVF) models. Each model was manufactured placing on a wooden table, two 5-cm tracts of great saphenous vein harvested from different patients to simulate the creation of a latero-lateral AVF. Surgeons could view the HD VITOM images displayed on a 26-inch flat screen at a comfortable viewing distance and angle (Fig. 1C).

For the anastomoses, a 9-0 polypropylene non-absorbable suture was employed. At the conclusion of each simulation, the surgeon and the assistants subjectively evaluate the following: surgeon: image quality, comfort with the VITOM® set-up and use, neck strain and fatigue; assistant: image quality and potential value in teaching operative procedures.

All the three surgeons found the set-up of the VITOM with articulated stand was easy to learn. They found it took approximately 10 minutes to set up initially, but this decreased to ≤5 minutes after several uses. During the operation, the VITOM magnification occasionally needed to be changed or required refocusing but this did not detract significantly from the natural progression of the procedure. Neck strain and fatigue were reduced compared with wearing magnifying loupes. The two surgical residents felt strongly that the VITOM images on an HD flat screen greatly enhanced their visualization of the operations performed and aided in their understanding of the procedures and associated key steps.

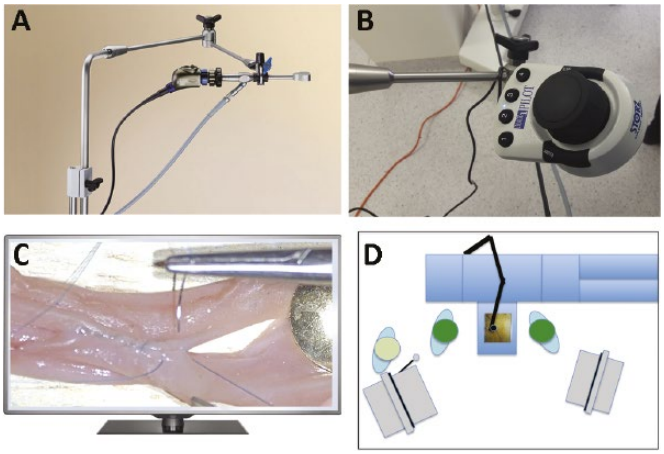

Fig. 1 - Video-assisted microsurgical vascular training model. (**A**) VERSACRANE™ Holding arm for Vitom® HD 3D system; (**B**) Image 1 Pilot of Vitom®; (**C**) Monitor 3D 26”; (**D**) Operative room set-up.

They also thought that VITOM not only enhanced their individual education, but would also be beneficial for presentation of live or recorded procedures for future resident education.

Disclosures

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