

## VIRTUAL REALITY TRAINER FOR LAPAROENDOSCOPIC SINGLE-SITE SURGERY– INITIAL RESULTS

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**BACKGROUND:** Laparoendoscopic single-site surgery (LESS) is a new laparoscopic technique gaining ground for multiple procedures and across specialties. It requires additional skills to be able to cope with limited triangulation and increased potential of instrument collision. The surgeon needs to acquire those skills before performing single-site surgery on patients. Training on the SEP virtual reality (VR) simulator's LESS module (SimSurgery AS, Norway) can be a useful tool to learn such skills without risk for the patient. This study presents, to our knowledge, the first VR simulator with a LESS training module, in addition to the initial results from its use. **METHODS:** User needs were identified after surgeons with extended experience in laparoscopy and LESS, in addition to the use of simulators for training, tested the prototypes and gave semi-structured interviews. After final release of the LESS module, surgeons with single-site laparoscopic experience and surgeons with only laparoscopic experience tested the simulator. Several parameters were recorded and compared. **RESULTS:** A LESS VR module based on user needs has been demonstrated. The solution is based on an existing reality platform for laparoscopic training, and established exercises and training methodologies have been easily transferred. The module consists of basic skills tasks and procedural tasks. The simulated instruments are non-company specific and can be curved, crossed or a combination of curved, crossed and straight. Face validity has been confirmed. Initial results indicate that surgeons with experience in LESS were faster, had less total tip trajectory and made fewer errors than surgeons without experience in single-port surgery for the tasks *Place arrow* and *Apply clips*. **CONCLUSIONS:** The LESS VR training module has been put into practice. The proficiency-based simulator will potentially make the transition from conventional laparoscopy to LESS safer and more efficient. Further studies are necessary to confirm validity and to advance the use of such simulators.

