Robot-assisted vitreoretinal surgery improves surgical accuracy compared with manual surgery: a randomized trial in a simulated setting

Eindhoven, The Netherlands, December 13, 2019 – Researchers from the Copenhagen University Hospital Rigshospitalet have concluded that robot-assisted vitreoretinal surgery improves precision and limits tissue damage compared with that of manual surgery. This comes initially at the cost of time, which is improved within 5 to 10 trials. In particular the performance of novice surgeons is enhanced with robot-assisted vitreoretinal surgery.

Ten experienced vitreoretinal surgeons and ten novice ophthalmic surgeons were included in a randomized controlled crossover study. The participants were randomized to start with either manual or robot-assisted surgery. Participants completed a test session consisting of three vitreoretinal modules on the Eyesi virtual-reality simulator by VRmagic. The automated metrics of performance supplied by the Eyesi simulator were used as outcome measures. Primary outcome measures were time with instruments inserted (seconds), instrument movement (mm), and tissue treatment (mm2).

The study showed that robot-assisted surgery allowed for greater precision in both novices and vitreoretinal surgeons. Furthermore, in particular novices using robot-assisted surgery inflicted less tissue damage when compared with that using manual surgery. Finally, the study showed that the time a robot-assisted procedure takes converges to the time of a manual procedure over a period of 5 to 10 trials, whilst initially taking more time for both novices and vitreoretinal surgeons.

The PRECEYES Surgical System R1.1 is the world's first CE-marked robot that has been clinically validated to assist surgeons in retinal surgery. The system is developed to assist trained surgeons during vitreoretinal surgical tasks in patients requiring vitreoretinal intervention under local or general anesthesia. The use of the robotic assistant is anticipated to not only improve treatment quality to be provided to patients, it also offers the possibility of developing completely new treatments. The system has a proprietary design and is developed in collaboration with clinicians to user requirements.

Further information

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About Preceyes B.V.

Preceyes is a medical robotics company focused on ocular surgery. The company develops, builds and commercializes innovative robotic solutions to assist eye surgeons in performing the most demanding surgical tasks. The company's first target is vitreoretinal surgery. The robot supports the surgeon in improving existing surgery and enables the development of new, high-precision treatments.
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