

Press release

Augmented reality in surgery: World's first “real” holographically navigated spine surgery

Zurich, 11 December 2020 – A team at Balgrist University Hospital successfully completed the first holographically navigated spine surgery. This surgery is part of a randomized clinical study which is the first of its kind in the world. The technology was developed at Balgrist University Hospital.

After years of research, augmented reality (AR) arrived in the operating theatre. With this, an eminent milestone has been reached. The first ever holographically navigated spine surgery with direct navigation was performed at Balgrist University Hospital at the beginning of December 2020. Prof. Dr. med. Mazda Farshad, Surgeon in Chief and Spine Surgeon, carried out the procedure with the help of AR glasses (HoloLens 2). With this first procedure, a randomized controlled clinical study is kicked off to verify the benefit of this surgical innovation. The world-first study marks the peak of the University Medicine Zurich flagship project SURGENT, conducted through a consortium of University institutions in Zurich and led by Prof. Mazda Farshad and Prof. Mirko Meboldt with strong involvement of Prof. Philipp Fürnstahl.

Augmented reality

Using CT imaging, 3D representations of the affected anatomy are generated and directly projected into the surgical field overlaying the real anatomy during the operation. With this, surgeons can see the patient's 3D anatomy. The AR navigation software guides critical step of the surgery. For example, the exact insertion point and trajectory of a screw is shown directly on the patient's anatomy. “AR enhances the surgeon's senses and improves their perception,” said Farshad, Principal Investigator and Medical Director of Balgrist University Hospital. SURGENT co-director Meboldt is also delighted: “The collaboration between visionary medical professionals like Mazda Farshad with the University of Zurich and the ETH is a unique opportunity and forms the basis for this success.”

The patient suffered of lower lumbar spine degeneration, a significantly narrowed spinal canal and corresponding strong pain and sensory disorders in the legs. His symptoms were gone after surgery and is doing well: “Regarding some of the pictures, I'm fascinated that something like that is possible. Therefore, I'm very proud to be the first patient in line.”

Contact for further information

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Pioneer study with holographically navigated spine surgery

The Swissmedic-approved study focuses on the possibility of using augmented reality (AR) to support spine surgery. It is part of Zurich University Medicine's SURGENT (Surgeon Enhancing Technologies) Flagship Project. Image data from AR glasses will soon make orthopedic surgery more efficient, precise, and safer for patients. The project is being carried out with Balgrist ROCS (Research in Orthopedic Computer Science) headed by Prof. Fürnstahl and Incremed, a university start-up supported by Balgrist Beteiligungs AG. Together with their technology partner, Microsoft, they are currently leveraging AR for developing the next-generation of surgical navigation solutions in orthopedics.

The principal investigator is Prof. Dr. med. Mazda Farshad, Head of the SURGENT Flagship Project and Medical Director of Balgrist University Hospital. The publication date for the study is not yet known.

About Balgrist University Hospital

Balgrist University Hospital is a highly specialized center of excellence for the diagnostic work-up, treatment, and follow-up care of damage to the musculoskeletal system. Interdisciplinary services combine the fields of orthopedics, paraplegiology, rheumatology and physical medicine, sports medicine, neuro-urology, chiropractic, radiology, and anesthesiology.

The broad spectrum of interlinked medical treatment is complemented by nursing care, social, insurance-legal and psychological counselling as well as integrated measures for rehabilitation and return to work. All these activities aim to provide our patients with the best possible support.

Balgrist University Hospital and the Balgrist Campus set internationally recognized standards in orthopedic research and education.

The privately owned Balgrist University Hospital is operated by the Balgrist Association.

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