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Media release

World's First Robotic-Assisted Surgery for Rare Inner Ear Disorder Performed in Bern

Medical breakthrough at Inselspital, University Hospital Bern: For the first time worldwide, surgeons and researchers successfully treated a rare inner ear disorder using robotic-assisted precision surgery in early August 2025. The procedure on a patient with superior canal dehiscence syndrome (SCDS) was successful and opens new treatment possibilities for those affected by this debilitating condition.

The surgical team employed the HEARO surgical robot during the procedure, which was originally developed at Inselspital Bern and the ARTORG Center for Biomedical Engineering Research at the University of Bern under the leadership of Prof. Dr. Marco Caversaccio and later brought to market by Swiss medtech company CAScination. While the robot is established in cochlear implantation procedures, this first documented intervention on the vestibular organ marks a milestone in minimally invasive ear surgery.

«This technology allows us to reach delicate structures of the inner ear with submillimetric precision,» said Dr. Philipp Aebischer, Group Leader at ARTORG Hearing Research Laboratory. «By adapting the cochlear implant workflow to this rare condition, we were able to treat the patient with exceptional accuracy while minimizing trauma to the vestibular organ.»

The affected person had suffered for years from debilitating symptoms: excessive perception of one's own bodily sounds (autophony), pulsatile tinnitus, and pressure-induced vertigo. The hybrid procedure was successful: The robot drilled two tiny access channels to the affected vestibular canal, after which the surgeons manually sealed the canal.

New Possibilities for Precision Surgery of the Ear

The treated person is recovering well – the most troubling symptoms have markedly improved, and hearing has been preserved. The team is already planning further applications of this technology.

Prior to the procedure, the involved team conducted a feasibility study: They virtually planned the surgery using computed tomography scans and tested this on an artificial temporal bone (a particularly hard part of the skull that protects the inner ear) in the laboratory to validate the approach and ensure safety for clinical application. «This successful outcome opens up new possibilities for expanding the use of surgical robots beyond cochlear implantation to other challenging procedures involving the ear and adjacent structures,» adds Prof. Dr. Georgios Mantokoudis, lead surgeon in this case and Deputy Head of the Department of Otorhinolaryngology at Inselspital. «This could sustainably redefine precision surgery in the ear.»

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