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INTRACOCHLEAR PRESSURE BEFORE AND AFTER STAPEDOTOMY WITH NEW CHAMBER STAPES PROSTHESIS

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Stapes prosthesis is a medical device that induces pressure wave in the cochlea and allows restoring hearing in patients with stapes otosclerosis. The postoperative hearing results are closely related to differential intracochlear pressure (DIP) between scala vestibuli (SV) and scala tympani (ST). Our new chamber stapes prosthesis (ChSP) has many advantages over currently used piston prosthesis. The design and functioning of the fluid-filled ChSP (Fig.1) mimics the natural stapes-vestibule interface, overcomes problems associated with length of piston prosthesis, and provides fluid volume displacement comparable to the normal ear

Biography

Monika Kwacz has completed her PhD from Warsaw University of Technology (Poland). She works as an Associate Professor at the Institute of Micromechanics and Photonics. She conducts biomedical research, manages R&D projects and is the Scientific Supervisor of the PhD students. She has published more than 25 papers in reputed journals.

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Any Comments:

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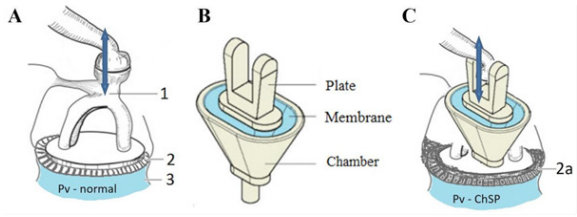

Fig.1- Normal ear (A), the fluid-filled ChSP (B) and functioning of the ChSP implanted in the ear (C). 1-stapes, 2-annular ligament, 2a-otosclerosis, 3-vestibule, Pv-pressure in vestibule in normal and implanted ear. Functioning of the ChSP has been previously verified by numerical simulations and vibration measurements. In this study, we present results of the intracochlear pressure measurement before and after stapedotomy with the ChSP. The ChSP prototype was made and implanted

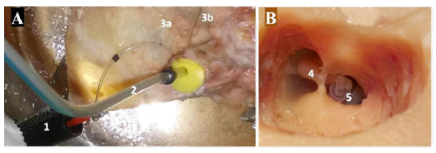

Fig.2. Experimental setup for pressure measurement (A) and the ChSP implanted in a specimen (B). 1-microphone, 2-sound delivery tube, 3a,3b-pressure sensors, 4-incus, 5-ChSP

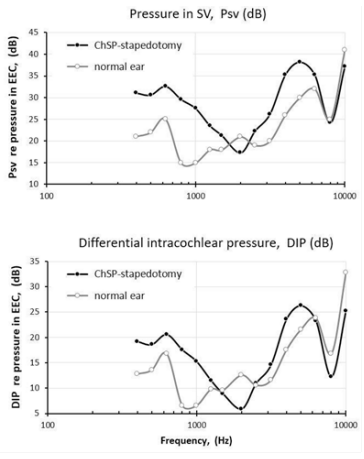

Fig.3. Pressure in the SV and differential intracochlear pressure in the normal (grey line) and implanted (black line) ear