**Retrospective Validation of Cochlear Duct Length and Electrode Insertion Depth Measures on Clinical CT Scans Using New Planning Software**

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**Background** Up until today, no clinically oriented three-dimensional reconstruction models of the cochlea are available. For this reason, statistical equations were previously applied to two-dimensional computed tomography (CT) images to estimate the cochlear duct length for appropriate electrode selection prior to cochlear implantation. Moreover, postoperative estimation of insertion angle of each electrode, needed for optimal frequency-place matched fitting, is often not available.

**Aim of the study** The threefold aim of this retrospective study was to investigate the clinical applicability of a new three-dimensional planning software (1) to obtain an optimal cochlear view prior to implantation to estimate the two turn length (2TL) in order to predict and select the optimal electrode length, (2) to visualize the actual postoperative electrode angular depth, and (3) to investigate the deviation between the preoperatively predicted electrode angular depth and the postoperatively measured actual electrode angular depth.

**Methods** Retrospective CT data are imported into an experimental planning software OTOPLAN. Using preoperative CT images, optimal three-dimensional cochlear views are pursued and 2TL are estimated. Using postoperative CT images, the electrode contacts are identified and, based on this identification, the actual insertion angle is calculated. Differences between the predicted insertion angle and the actual insertion angle are registered.

**Results** Good correlations were obtained. Detailed data will be provided and discussed.

**Conclusion** The new planning software fulfills the needs for a quick patient-specific three-dimensional reconstruction and easily visualizes each patient’s unique anatomy. Postoperative reconstructions can be used to accurately determine the electrode insertion angles.