

Cochlear implants in single sided deafness: luxury or necessity?

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Introduction: Patients with single sided deafness (SSD) experience difficulties with speech understanding in noisy environments and problems with localization of sounds. Selected group of patients with SSD who also suffer from unbearable ipsilateral tinnitus can get their tinnitus suppressed by electrical stimulation in the Sint Augustinus Hospital in Wilrijk, Belgium. Application of cochlear implants (CIs) in this group of patients allowed us to observe additional benefit for speech understanding in noise and improved spatial perception of sound.

Objective: To evaluate the audiological results of CIs in patients with SSD.

Methods: Ten patients with SSD have received a CI, including one congenitally deaf child of 15 months old. In 8 patients the duration of SSD was relatively short (less than 3 years). After at least 6 months of CI use the results of tonal audiometry, phoneme detection and discrimination test at 70 dBHL and speech understanding using the Dutch NVA word lists (CVC words V phonemic score) in quiet have been evaluated and compared to matched CI patients with bilateral deafness. All these test were performed with the contralateral ear masked according to our masking protocol. In order to investigate the binaural effects, we measured the benefit of speech perception in noise, as well as the localization capabilities in two conditions: with CI and without CI.

Results: When the noise source was placed at the good ear and the speech signal at the CI side the improvement of speech discrimination was up to 20% at 0 dB S/N and 40% at -5dB S/N. Presence of noise at the CI side did not cause detrimental effects on speech understanding with the good hearing ear. Results of the localization tests will be presented too.

Conclusions: CI in SSD results in significant improvement of speech understanding in noise, and improved spatial perception of sound with CI suggests re-activation of the binaural processing.