

Beitrag wird präsentiert am 10.03.2011 um 10.45 Uhr im Rahmen der SS01.

Contributions of emission tomography in auditory implantation

G. Berding (1), F. Wilke (2), H. Lim (3), S. Balster (3), M. Durisin (3), G. Baillot (1), L. Geworski (2), A. Lesinski-Schiedat (3), T. Lenarz (3)

(1) Hannover Medical School, Departments of Nuclear Medicine, (2) Medical Physics and Radiation Protection² and (3) Otolaryngology

Emission-computed-tomography (ECT) allows to detect regional changes of cerebral blood-flow due to stimulation of the auditory system. Thereby radiopharmaceuticals labelled either with single-photon or positron emitters are used for imaging with SPECT or PET. Typically SPECT is easier to perform, with lower spatial resolution but the option to separate stimulation and imaging procedure. PET is more costly, but it provides statistical outcome measures. Both methods can be employed after implantation, when fMRI is contraindicated. In patients with malfunctioning implant disturbance of the central auditory pathway has to be considered before re-implantation. ECT in conjunction with promontory electrode stimulation can give prognostic information here. In patients with auditory implants ECT offers an objective measure of function. This can be of help in patients not able to cooperate (e.g. small children). Moreover, in innovative types of implants, cortical activations can be assessed with respect to their significance level, extension and anatomical localisation. Comparison to well established types of implants as well as optimization of strategies to process auditory stimuli are possible. We employed PET in children with congenital deafness to assess post cochlear transmission of promontory stimulation during anaesthesia. In 18% we found significant activations in Brodmann areas 41, 42 or 22 – speaking against disturbances in the central auditory pathway counteracting cochlea implantation. In a group of adult patients with auditory brainstem implants, a correlation between speech performance and relative increase of blood flow in the auditory cortex was observed ($r\text{-square}=0.8$ $p<0.005$).

Literatur:Johnsrude IS, Giraud AL, Frackowiak RS. Functional imaging of the auditory system: the use of positron emission tomography. *Audiol Neurootol.* 2002 Sep-Oct7(5):251-76.

