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**A new implantable middle ear hearing device for mixed hearing loss:
A feasibility study in human temporal bones**

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It was the objective of a study to assess the feasibility of a new active, middleear device that is designed for patients with mixed hearing loss subsequent to chronic ear surgery or middle ear trauma. This prosthesis (PORP-Vibroplasty) is built of a VIBRAMT MED-EL Vibrant Soundbridge® and a Kurz Bell® titanium partial ossicular replacement prosthesis (PORP).

In three fresh temporal bones the normal and reconstructed middle ear was analyzed by laser Doppler interferometry. Sound transmission properties of a PROP, a passive and an active PORP-Vibroplasty were compared to the normal middle ear function.

The measurement method provided reliable results with small standard deviations and good signal to noise ratios (SNRs). PORP and the passive PORP-Vibroplasty performance were comparable to normal middle ear function. The activated PORP-Vibroplasty provided linear function and a flat frequency response within the measured frequency range (500Hz - 8kHz) with peak deviations of less than 10dB. The maximum output of the PORP-Vibroplasty was equivalent to 125dB SPL.

In conclusion the PORP-Vibroplasty implantation is feasible in temporal bones. PORP-Vibroplasty performance is sufficient to allow for a clinical trial as a next step.