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PDF文档

耳声发射信号的小波分析及应用

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为了利用瞬态诱发耳声发射信号,对耳蜗性和蜗后性两种感音神经性耳聋进行病变诊断和定位,提出了一种基于小波变换的方法,用于对感音神经性耳聋病变进行诊断和定位。首先,获取听力正常耳信号的小波变换的对数均方根-频率曲线范围,及在对侧刺激声作用下,信号受抑制的小波变换的对数均方根-频率曲线范围;然后根据某一受试耳有无对侧刺激声作用下的瞬态诱发耳声发射信号,得出其小波变换的对数均方根曲线及受抑制的对数均方根曲线;最后,检测受试耳的两条曲线是否分别在正常值范围内,由此对受试耳的耳蜗及内侧橄榄耳蜗系统功能进行检测,同时根据每一条曲线将蜗性及蜗后病变定位到某一细致的频带。此方法与目前临床上采用的耳声发射结合ABR和纯音测听的诊断方法能很好地吻合。

CLINICAL APPLICATION AND WAVELET ANALYSIS OF TRANSIENT EVOKED OTOACOUSTIC EMISSIONS （TEOAE） SIGNALS

In order to diagnose and locate the defected site of two main sensori-neural hearing loss which are cochlear hearing loss and retrocochlear hearing loss, a technique that based on continuous wavelet transform for the signals of Transient E-voked Otoacoustic Emissions （TEOAE） and TEOAE suppressed by contralateral acoustic stimulation （CAS） was proposed. First, two curves' range, which are information about the relation of TEOAE's Root Mean Square （RMS） -frequency and the relation of the suppressed RMS-frequency for the normal hearing ears were obtained. Then, the subject's RMS-frequency curve and the suppressed RMS-frequency curve were compared with the two normal-hearing curves' range. The sensori-neural hearing loss disease can be diagnosed, and the defected site can be further located. A comparison is made between the clinical methods and our technique for the same subject and the result are essentially consistent. This technique provided the quantitative analysis method for studying the function of the auditory efferent system, and potentially promoted the fundamental study and the clinical application of the Otoacoustic emissions.

关键词

瞬态诱发耳声发射(Transient evoked otoacoustic emissions); 连续小波变换(Continuous wavelet transform); 对侧刺激声(Contralateral acoustic stimulation); 蜗性听力损伤(Cochlear hearing loss); 蜗后性听力损伤(Retrocochlear hearing loss)