

诺尔康文摘

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双侧人工耳蜗植入专题

浙江诺尔康神经电子科技股份有限公司
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文献摘要

Stable benefits of bilateral over unilateral cochlear implantation after two years: A randomized controlled trial.

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Abstract

To investigate hearing capabilities and self-reported benefits of simultaneous bilateral cochlear implantation (BiCI) compared with unilateral cochlear implantation (UCI) after a 2-year follow-up and to evaluate the learning effect of cochlear implantees over time. Multicenter randomized controlled trial. Thirty-eight postlingually deafened adults were included in this study and randomly allocated to either UCI or simultaneous BiCI. Our primary outcome was speech intelligibility in noise, with speech and noise coming from straight ahead (Utrecht-Sentence Test with Adaptive Randomized Roving levels). Secondary outcomes were speech intelligibility in noise with spatially separated sources, speech intelligibility in silence (Dutch phoneme test), localization capabilities and self-reported benefits assessed with different quality of hearing and quality of life (QoL) questionnaires. This article describes the results after 2 years of follow-up. We found comparable results for the UCI and simultaneous BiCI group, when speech and noise were both presented from straight ahead. Patients in the BiCI group performed significantly better than patients in the UCI group, when speech and noise came from different directions ($P = 0.01$). Furthermore, their localization capabilities were significantly better. These results were consistent with patients' self-reported hearing capabilities, but not with the questionnaires regarding QoL. We found no significant differences on any of the subjective and objective reported outcomes between the 1-year and 2-year follow-up. This study demonstrates important benefits of simultaneous BiCI compared with UCI that remain stable over time. Bilaterally implanted patients benefit significantly in difficult everyday listening situations such as when speech and noise come from different directions. Furthermore, bilaterally implanted patients are able to localize sounds, which is impossible for unilaterally implanted patients..

Article source:

Van Z A, Smulders Y E, Stegeman I, et al. Stable benefits of bilateral over unilateral cochlear implantation after two years: A randomized controlled trial.[J]. *Laryngoscope*, 2017, 127(5):1161.

参考译文:

术后两年双侧优于单侧人工耳蜗植入的稳定受益：随机对照试验

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【摘要】

为了评估术后2年随访时双侧人工耳蜗植入 (BiCI) 相对于单侧人工耳蜗植入 (UCI) 的听觉能力和患者自述受益, 以及植入者随着时间的学习效果, 本研究进行了多中心随机对照实验, 共纳入38例成人语后聋患者并随机分配为单侧 (UCI) 或同时双侧 (BiCI)。主要结果是噪声下的言语清晰度, 来自头部的言语和噪声 (使用自适应随机调整水平的乌得勒支句子测试); 次要结果为来源于不同方向的噪声中的言语清晰度, 安静环境下的言语清晰度 (荷兰音素测试), 定位能力和使用不同听力与生活质量 (QoL) 问卷的自我评价。本研究描述术后2年的随访结果。研究发现当言语和噪声来自头部前方时, 单侧和双侧存在可比性的结果; 当言语和噪声来自不同方向时, 双侧植入组的表现显著好于单侧植入组 ($P < 0.01$), 并且他们的定位能力也显著较好。这些结果与植入组的听声能力的自我评价一致, 但是与QoL问卷结果不一致。我们发现术后1年和术后2年的主观和客观评价均没有差别。这项研究结果表明双侧植入相对于单侧植入的优势能够长期维持稳定, 在复杂的日常听声环境中 (例如来自不同方向的言语和噪声) 双侧植入者受益更显著, 此外, 双侧植入者能够进行声音定位, 而单侧植入者不能进行声音定位。

Bilateral cochlear implantation in children: a systematic review and best-evidence synthesis.

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Abstract

Objectives/hypothesis:

To evaluate the effectiveness of bilateral cochlear implantation over unilateral implantation in children with sensorineural hearing loss.

Data sources:

Pubmed, Embase, and Web of Science.

Review methods:

All studies comparing a bilateral cochlear implant group with a unilateral implant group were included.

Results:

Twenty-one studies compared a bilateral cochlear implant group with a unilateral group. No randomized trials were identified. Due to the clinical heterogeneity, statistical pooling was not feasible and a best-evidence synthesis was performed. The results of this best-evidence synthesis indicate the positive effect of the second implant for especially sound localization and possibly for preverbal communication and language development. There was insufficient evidence to make a valid comparison between bilateral implantation and a bimodal fitting.

Conclusion:

Although randomized trials are lacking, the results of our best-evidence synthesis indicate that the second cochlear implant might be especially useful in sound localization and possibly also in language development.

Key Words: Cochlear implantation; best-evidence synthesis; bilateral; bimodal; deafness; hearing loss; systematic review; unilateral.

Article source:

Lammers M J, GJ V D H, Pourier V E, et al. Bilateral cochlear implantation in children: a systematic review and best-evidence synthesis[J]. Laryngoscope, 2014, 124(7):1694.

参考译文：

儿童双侧人工耳蜗植入：系统综述与最佳证据合并

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【摘要】

目的：

评价感音神经性聋儿童双侧人工耳蜗植入相对于单侧人工耳蜗植入的效果。

数据来源：

Pubmed、Embase、Web of Science。

综述方法：

纳入比较双侧人工耳蜗和单侧人工耳蜗植入效果的所有研究。

结果：

共纳入21项比较双侧人工耳蜗植入和单侧人工耳蜗植入效果的研究，这些研究中没有随机对照研究。由于临床异质性不适合进行统计合并，我们采用了最佳证据合并。最佳证据合并结果表明，第二个植入的人工耳蜗在特定的声音定位和可能的语言沟通和语言发展方面发挥了积极作用。但是没有足够的证据在双侧植入和双模式听声之间进行有效的比较。

结论：

尽管缺少随机对照试验，但是我们的最佳证据合并结果仍然表明第二个植入的人工耳蜗可能在声源定位以及语言发育方面特别有用。

【关键词】 人工耳蜗植入；最佳证据合成；双侧；双模式；耳聋；听力损失；系统评价；单侧。

Sequential bilateral cochlear implantation in the adolescent population.

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Abstract

Objectives: To examine the variables affecting outcomes for sequential bilateral cochlear implantation patients in the adolescent population.

Study design: Retrospective chart review at tertiary care center.

Methods: Main outcome measures were open set speech recognition tests at the word (Consonant-Nucleus-Consonant/Phonetically Balanced Kindergarten List Test [CNC/PBK]) and sentence levels in noise (Hearing in Noise Test-Noise [HINT-N]) in different test conditions with respect to the age at first and sequential implantation, as well as the interval between implants.

Results: Despite a mean age at sequential implantation of 13.5 years, sequential bilateral implanted adolescents revealed significant improvement in the sequential cochlear implant (CI2) ear. The mean time interval between implants was 8.2 years. A wide range of performance was noted, and age at implantation and interval between first cochlear implant (CI1) and CI2 did not predict outcome. Mean CNC/PBK score with CI1 alone was 83.0%, with the CI2 alone was 56.5%, and with bilateral implants was 86.8%. Sentence scores (HINT-N) were 89.5% for CI1, 74.2% for CI2, and 94.4% for bilateral CI condition. The clinical relevance of these enhanced perception abilities requires attention to individual device use, performance with the first implant, and subjective benefits reported by patients.

Conclusions: Bilateral sequential cochlear implantation leads to improved speech perception in the adolescent population and should be considered in this population, even after a long period of deafness and despite a prolonged interval between implants. Numerous factors affect the ability to predict performance, but age at implantation and interimplant interval were not correlated with performance measures. Extensive preoperative counseling and individualized evaluation are critical to ensure that patients and families understand the range of possible outcomes.

Key Words: Adolescent, pediatric cochlear implants; bilateral; sequential.

Article source:

Friedmann D R, Green J, Fang Y, et al. Sequential bilateral cochlear implantation in the adolescent population.[J]. Laryngoscope, 2015, 125(8):1952-8.

参考译文：

青少年人群中相继双侧人工耳蜗植入术

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【摘要】

目的：探讨影响青少年相继双侧人工耳蜗植入患者预后的因素。

实验设计：在三级护理中心进行回顾性分析。

方法：主要测试指标为考虑不同测试条件（第一次、第二次植入以及相继植入时间间隔）的开放式言语测试，包括字词（辅音-核-辅音/语音平衡幼儿园列表测试[CNC/PBK]）和噪声句子水平（噪声测试中噪声下的听觉[HINT-N]）。

结果：尽管相继人工耳蜗植入的平均年龄为13.5岁，相继双侧人工耳蜗植入的青少年植入者反映第二个植入人工耳蜗（CI2）耳的听力有显著改善。相继植入的平均时间间隔为8.2年。我们注意到听声表现的差异范围较大，并且植入年龄和相继植入时间间隔不能预测植入效果。使用第一个人工耳蜗（CI1）的CNC/PBK的平均得分为83.0%，使用第二个人工耳蜗（CI2）的CNC/PBK的平均得分为56.5%，使用双侧人工耳蜗的CNC/PBK的平均得分为86.8%。据此测试的结果为：第一个人工耳蜗为89.5%，第二个人工耳蜗为74.2%，双侧人工耳蜗为94.4%。这些增强的临床感知能力需要注意个体耳蜗设备的使用、第一个植入体的表现、患者报告的主观受益。

结论：即使耳聋时间长或者相继人工耳蜗植入间隔时间长，双侧相继人工耳蜗植入仍然可以改善青少年人群的言语感知，双侧植入应该考虑这个群体。影响预后表现的因素众多，但是植入年龄和相继植入人工耳蜗的时间间隔和植入效果评价无相关性。广泛的术前咨询和个体评估对于患者和家属事先了解可能出现的结果非常重要。

【关键词】 青少年；儿童人工耳蜗植入；双侧；相继。

Bilateral cochlear implantation for hearing-impaired children: criterion of candidacy derived from an observational study.

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Abstract

Objectives: Policy-makers have struggled to define the minimum degree of hearing impairment at which children should be offered cochlear implants rather than the less invasive alternative of acoustic hearing aids. This study compared outcomes for children with bilateral cochlear implants and children with bilateral hearing aids, to determine a criterion of candidacy for pediatric bilateral cochlear implantation.

Design: This observational study measured the listening skills of children who received routine audiological care in the United Kingdom. Participants were recruited from hospitals, educational services, and charities. Eligibility criteria included a diagnosis of hearing impairment before 31 months of age and pure-tone thresholds greater than or equal to 50 dB HL at 2 and 4 kHz bilaterally. Seventy-one children participated, aged 46 to 86 months (mean 64 months). Twenty-eight children used bilateral implants provided in a simultaneous surgery; 43 used bilateral digital hearing aids. The two groups of children were demographically similar in variables that predict outcomes for children with hearing impairment. Children's ability to understand speech was measured using closed-set tests of word discrimination in three conditions: in quiet, in pink noise, and in two-talker babble. For each listening test, an actuarial method was used to compare the distribution of scores from children with cochlear implants and children with hearing aids. The aim was to calculate the unaided pure-tone average (PTA) hearing level at which a child has odds of 4:1 of a better outcome with implants than with hearing aids. The PTA associated with odds of 4:1 has been used previously to define criteria of candidacy for implantation. The main analyses used a four-frequency PTA (mean of unaided thresholds at 0.5, 1, 2, and 4 kHz in the better-hearing ear). Additional analyses used a three-frequency PTA (0.5, 1, and 2 kHz) and two-frequency PTA (2 and 4 kHz).

Results: Odds of 4:1 of a better outcome with implants were associated with a four-frequency PTA of 79, 86, and 76 dB HL for tests of word discrimination in quiet, noise, and babble, respectively. The mean of these three estimates is 80 dB HL. It can be difficult to measure a four-frequency PTA in young children, but a two-frequency PTA typically can be measured. Odds of 4:1 were associated with a two-frequency PTA of 83, 92, and 80 dB HL for tests of word discrimination in quiet, noise, and babble, respectively. The mean of these three estimates is 85 dB HL.

Conclusions: Children with an unaided four-frequency PTA of 80 dB HL or poorer in both ears should be considered candidates for bilateral cochlear implantation. In cases where a four-frequency PTA cannot be measured, the criterion of candidacy should be a two-frequency PTA of 85 dB HL or poorer in both ears. If adopted by policy-makers, these recommendations would expand the provision of cochlear implants among children in England and Wales.

Article source:

Lovett R E, Vickers D A, Summerfield A Q. Bilateral cochlear implantation for hearing-impaired children: criterion of candidacy derived from an observational study.[J]. Ear & Hearing, 2015, 36(1):14-23.

参考译文：

听障儿童双侧人工耳蜗植入：源自观测研究的候选标准

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【摘要】

目标：政策制定者努力界定听障儿童应该进行人工耳蜗植入的最小听障程度，而不是选择微创的声音助听器。本研究通过比较双侧人工耳蜗植入儿童与双侧助听器助听儿童的效果来确定儿童双侧植入的候选标准。

实验设计：这项观察研究测试在英国接受常规听力学护理的儿童听力技巧，合格的标准包括31个月之前的听力学诊断和双侧2KHz和4KHz纯音听阈大于50dB HL。共纳入71例儿童，平均年龄64个月，年龄范围46-86个月。28例儿童使用同时进行手术的双侧人工耳蜗，43例使用双侧数字助听器。在影响听障儿童预后效果的变量方面，两组儿童的构成结构特征相似。使用安静、白噪声和噪声下对话三种条件下的词语辨别闭合测试来测试儿童的言语理解能力，每项听力测试均使用精算方法比较佩戴人工耳蜗组和佩戴助听器组儿童得分的分布，其目的为计算人工耳蜗植入儿童的效果和助听器儿童的效果的优势比为4: 1时的裸耳纯音平均听阈。主要使用4频率（好耳在0.5、1、2、4KHz的平均裸耳听阈）纯音平均听阈进行分析，其次使用3频率（0.5、1、2 KHz）纯音平均听阈和2频率（2、4KHz）纯音平均听阈进行分析。

结果：双侧裸耳4频率纯音听阈为80dB HL或者更差的儿童应该被视为双侧人工耳蜗植入的候选者，在不能测量4频率PTA的情况下，候选标准应是双侧2频率PTA为85dB HL或更差。如果政策制定者能够采纳这些建议，这些建议将扩大英国和威尔士地区的儿童人工耳蜗植入的适应范围。

【关键词】听障；双侧；儿童；人工耳蜗；

Bilateral cochlear implantation.

Wanna GB¹, Gifford RH, McRackan TR, Rivas A, Haynes DS.

Otolaryngologic Clinics of North America.

Abstract

Cochlear implantation (CI) is the standard of care for the treatment of children and adults with bilateral severe-to-profound sensorineural hearing loss. Because the ultimate and continuous goal of CI teams is to improve patient performance, a potential method is bilateral CI. The potential benefits of bilateral CI include binaural summation, squelch, equivalent head shadow for each ear, improved hearing in noise, sound localization ability, and spatial release from masking. The potential disadvantages include additional or prolonged surgical procedure, unproven cost/benefit profile, and the elimination of the ability to use future technologies and/or medical therapies in the implanted ear.

Key Words: Bilateral; cochlear implantation.

Article source:

Wanna G B, Gifford R H, Mcrackan T R, et al. Bilateral cochlear implantation.[J]. Otolaryngologic Clinics of North America, 2012, 45(1):81.

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听力损失与阿尔兹海默病

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北美耳鼻喉科诊所

【摘要】

人工耳蜗 (CI) 是治疗双侧重度至极重度感音神经性聋儿童和成人的医疗护理标准。由于人工耳蜗的终极和持续目标是改善听障患者的听力表现，因此双侧人工耳蜗也是一种潜在的方法。双侧的潜在受益包括双耳总和效应、静噪效应、每侧耳同等的头影效应，提高噪声下的听力、声音定位能力和释放掩蔽的空间效应；潜在的弊端包括额外或延长的外科手术、未经证实的成本/收益情况、以及丧失了使用未来技术或药物治疗人工耳蜗植入耳的能力。

【关键词】 双侧；人工耳蜗植入术；

The effect of device use after sequential bilateral cochlear implantation in children: An electrophysiological approach.

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Abstract

Objectives: In many studies evaluating the effect of sequential bilateral cochlear implantation in congenitally deaf children, device use is not taken into account. In this study, however, device use was analyzed in relation to auditory brainstem maturation and speech recognition, which were measured in children with early-onset deafness, 5-6 years after bilateral cochlear implantation. We hypothesized that auditory brainstem maturation is mostly functionally driven by auditory stimulation and is therefore influenced by device use and not mainly by inter-implant delay.

Methods: Twenty-one children participated and had inter-implant delays between 1.2 and 7.2 years. The electrically-evoked auditory brainstem response was measured for both implants separately. The difference in interaural wave V latency and speech recognition between both implants were used in the analyses. Device use was measured with a Likert scale.

Results: Results showed that the less the second device is used, the larger the difference in interaural wave V latencies is, which consequently leads to larger differences in interaural speech recognition.

Conclusions: In children with early-onset deafness, after various periods of unilateral deprivation, full-time device use can lead to similar auditory brainstem responses and speech recognition between both ears. Therefore, device use should be considered as a relevant factor contributing to outcomes after sequential bilateral cochlear implantation. These results are indicative for a longer window between implantations in children with early-onset deafness to obtain symmetrical auditory pathway maturation than is mentioned in the literature. Results, however, must be interpreted as preliminary findings as actual device use with data logging was not yet available at the time of the study.

Key Words: Bilateral cochlear implants; Device use; Electrically evoked auditory brainstem response; Pediatric; Speech recognition.

Article source:

Sparreboom M, Beynon A J, Snik A F, et al. The effect of device use after sequential bilateral cochlear implantation in children: An electrophysiological approach[J]. International Journal of Pediatric Otorhinolaryngology, 2016, 86:161-166.

参考译文:

儿童双侧相继人工耳蜗植入的术后设备使用效果：电生理学方法

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【摘要】

目的: 在很多评估先天性聋儿童相继双侧人工耳蜗植入的术后效果的研究中没有考虑人工耳蜗设备使用这一因素。本研究通过测试双侧植入人工耳蜗的早发性耳聋儿童术后5-6年的设备使用情况, 分析了人工耳蜗设备使用与听觉脑干成熟和语音识别的联系。我们提出的假说是听觉脑干成熟主要由听觉刺激驱动, 因此受设备使用的影响, 而不是主要受植入时间间隔的影响。

方法: 21例儿童参与了本研究, 植入时间间隔范围为1.2-7.2年, 并分别测试了两个人工耳蜗的电诱发脑干听觉诱发电位, 并分析了两个人工耳蜗的耳间V波潜伏期差异和言语识别差异, 使用李克特量表 (Likert scale) 测试了设备使用情况。

结果: 结果显示第二个人工耳蜗使用的越少, 耳间V波潜伏期差异越大, 相应地导致耳间言语识别差异更大。

结论: 经过不同时期的单侧剥夺后, 在早发性耳聋患儿中全天使用人工耳蜗可以产生类似的听觉脑干反应和双耳之间的语音识别。因此, 双侧相继人工耳蜗植入术后应该考虑到人工耳蜗设备使用也是影响术后效果的一个相关因素。这些结果表明, 在早发性耳聋儿童在两次人工耳蜗植入手术之间有一个比文献中提到的较长的窗口来获得对称性听觉通路成熟; 然而, 由于在研究时缺乏实际的人工耳蜗设备使用的数据记录, 本研究结果为初步发现。

【关键词】 双侧人工耳蜗植入; 设备使用; 电诱发听觉脑干反应; 儿童; 言语识别.

Bilateral sequential adult cochlear implantation: who should receive priority in the context of a constrained health care system?

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Abstract

Resource allocation decisions have become increasingly necessary as the cost of health care habitually increases. Bilateral (second side) adult cochlear implantation (CI) is an example of a novel technology with accruing evidence of benefit, yet expense has limited universal employ. Currently at our centers, bilateral implantation is only provided under research protocol. In this article, we discuss the need for a principled approach concerning the distribution of a second device, both during this period of investigation and if ultimately an insured service. Allocation strategies, while extensively addressed in some arenas, have yet to be developed for second-side sequential adult CI. We advocate that physicians must assume an explicit role when both caring for individual patients as well as administering health care programs. We review social justice theories that inform resource allocation macrodecisions, and include a defence of age-based considerations. Our approach to patient selection for adult second-side CI sequentially considers clinical criteria (directly addressed in the article), a willingness to participate in rigorous research, and a 65 year cut-off. Ultimately, we employ random blinded selection for allocating bilateral CI among the remaining similarly situated individuals. This approach functions impartially and in a manner that is transparent for both patient and physician..

Key Words: Bilateral, cochlear implantation.

Article source:

Forzley B, Chen J, Nedzelski J, et al. Bilateral sequential adult cochlear implantation: Who should receive priority in the context of a constrained health care system?[J]. *Laryngoscope*, 2013, 123(12):3137-40.

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成人双侧相继人工耳蜗植入：在有限的卫生保健系统中谁应该获得优先救助？

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【摘要】

随着医疗费用的不断增加，资源分配决策变得越来越有必要。双侧（两侧）成人人工耳蜗植入术（CI）是一种已证实能够增加受益的新技术，但是昂贵的费用限制了其普遍应用。目前在我们中心，双侧植入术只在实验研究中进行。在本研究中，我们探讨了进行第二个耳蜗设备植入手术的原则性方法，包括前期调查期间和最终医疗服务。分配策略尽管在一些领域广泛应用，然而还没有应用于成人第二个人工耳蜗的植入手术。当需要兼顾照顾病人和管理医疗健康项目时，我们主张医生要扮演明确的角色。我们综述了宏观信息资源配置的社会公正理论，并包括了基于年龄的辩护考虑。我们对成人双侧相继人工耳蜗植入手术的选择方法考虑到了临床标准（详见文中描述）、参与严格研究的意愿并截止到65岁。最终我们决定采用随机盲法选择在剩余的相似个体中分配双侧人工耳蜗植入手术，这种方法是公正的，在一定程度上对医生和患者都是透明的。

【关键词】 双侧；人工耳蜗植入；

Bilateral cochlear implants in children: Effects of auditory experience and deprivation on auditory perception.

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Abstract

Spatial hearing skills are essential for children as they grow, learn and play. These skills provide critical cues for determining the locations of sources in the environment, and enable segregation of important sounds, such as speech, from background maskers or interferers. Spatial hearing depends on availability of monaural cues and binaural cues. The latter result from integration of inputs arriving at the two ears from sounds that vary in location. The binaural system has exquisite mechanisms for capturing differences between the ears in both time of arrival and intensity. The major cues that are thus referred to as being vital for binaural hearing are: interaural differences in time (ITDs) and interaural differences in levels (ILDs). In children with normal hearing (NH), spatial hearing abilities are fairly well developed by age 4–5 years. In contrast, most children who are deaf and hear through cochlear implants (CIs) do not have an opportunity to experience normal, binaural acoustic hearing early in life. These children may function by having to utilize auditory cues that are degraded with regard to numerous stimulus features. In recent years there has been a notable increase in the number of children receiving bilateral CIs, and evidence suggests that while having two CIs helps them function better than when listening through a single CI, these children generally perform worse than their NH peers. This paper reviews some of the recent work on bilaterally implanted children. The focus is on measures of spatial hearing, including sound localization, release from masking for speech understanding in noise and binaural sensitivity using research processors. Data from behavioral and electrophysiological studies are included, with a focus on the recent work of the authors and their collaborators. The effects of auditory plasticity and deprivation on the emergence of binaural and spatial hearing are discussed along with evidence for reorganized processing from both behavioral and electrophysiological studies. The consequences of both unilateral and bilateral auditory deprivation during development suggest that the relevant set of issues is highly complex with regard to successes and the limitations experienced by children receiving bilateral cochlear implants.

Key Words: Children; cochlear impairment.

Article source:

Litovsky R Y, Gordon K. Bilateral cochlear implants in children: Effects of auditory experience and deprivation on auditory perception[J]. *Hearing Research*, 2016, 338:76.

参考译文：

儿童双侧人工耳蜗植入：听觉经验和剥夺对听觉感知的影响

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【摘要】

空间听觉能力对儿童的成长、学习和玩耍至关重要，这些能力能够为环境声源位置信息提供重要线索，分离出重要的声音，例如言语、背景标记或干扰。空间听觉能力依赖可用的单耳和双耳线索，双耳线索产生于不同位置的声音到达双耳后的声音整合，双耳系统有很好的机制来捕捉两耳声音到达时间和强度上的差异。因此双耳听觉至关重要的线索为：耳间时间差（ITDs）和耳间水平差（ILDs）。在正常听力（NH）的儿童中，4-5岁时空间听觉能力发育的相当完善。相反，多数听障儿童和使用人工耳蜗助听（CIs）的儿童生活中没有体验正常双侧听觉的机会。这些孩子可以通过利用许多刺激特征退化的听觉线索来发挥作用。近年来接受双侧人工耳蜗植入的儿童数量显著增加，有证据表明双侧人工耳蜗植入的听觉功能好于单侧人工耳蜗植入，但是他们的听觉表现普遍差于听力正常的同龄人。本文综述了近年来关于儿童双侧人工耳蜗植入的一些工作，研究关注点是测试空间听觉，包括声源定位、噪声掩蔽中的言语理解、使用研究处理器的双侧感知，同时纳入行为学和电生理研究的数据，主要关注作者及其合作者目前的工作。本研究讨论了听觉可塑性和剥夺对双耳空间听觉发育的影响，以及一些来自行为学和电生理研究的重组形成的证据。在发育过程中单侧和双侧听觉剥夺的影响表明，有关儿童接受双侧人工耳蜗植入的成功和局限性的相关问题是复杂的。

【关键词】 儿童；人工耳蜗植入；

The effect of early auditory experience on the spatial listening skills of children with bilateral cochlear implants.

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Abstract

Objectives: Both electrophysiological and behavioural studies suggest that auditory deprivation during the first months and years of life can impair listening skills. Electrophysiological studies indicate that 3½ years may be a critical age for the development of symmetrical cortical responses in children using bilateral cochlear implants. This study aimed to examine the effect of auditory experience during the first 3½ years of life on the behavioural spatial listening abilities of children using bilateral cochlear implants, with reference to normally hearing children. Data collected during research and routine clinical testing were pooled to compare the listening skills of children with bilateral cochlear implants and different periods of auditory deprivation.

Methods: Children aged 4-17 years with bilateral cochlear implants were classified into three groups. Children born profoundly deaf were in the congenital early bilateral group (received bilateral cochlear implants aged ≤3½ years, n=28) or congenital late bilateral group (received first implant aged ≤3½ years and second aged >3½ years, n=38). Children with some bilateral acoustic hearing until the age of 3½ years, who subsequently became profoundly deaf and received bilateral cochlear implants, were in the acquired/progressive group (n=16). There were 32 children in the normally hearing group. Children completed tests of sound-source localization and spatial release from masking (a measure of the ability to use both ears to understand speech in noise).

Results: The acquired/progressive group localized more accurately than both groups of congenitally deaf children (p<0.05). All three groups of children with cochlear implants showed similar spatial release from masking. The normally hearing group localized more accurately than all groups with bilateral cochlear implants and displayed more spatial release from masking than the congenitally deaf groups on average (p<0.05).

Conclusion: Children with bilateral cochlear implants and early experience of acoustic hearing showed more accurate localization skills, on average, than children born profoundly deaf.

Key Words: Children; Bilateral cochlear implantation.

Article source:

Killan C F, Royle N, Totten C L, et al. The effect of early auditory experience on the spatial listening skills of children with bilateral cochlear implants.[J]. International Journal of Pediatric Otorhinolaryngology, 2015, 79(12):2159.

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早期听觉经验对双侧人工耳蜗植入儿童空间听力技能的影响

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【摘要】

目标: 电生理学和行为学研究表明声母最初几个月和几年的听力剥夺会削弱听力技巧。电生理研究表明3½可能是双侧人工耳蜗植入儿童对称性皮层反应发育的关键时期。本研究旨在探讨早期3½年的听觉经验对双侧人工耳蜗植入儿童空间听觉行为的影响, 对照组为正常听力的儿童, 收集研究期间和常规临床测试中的数据, 比较双侧人工耳蜗植入儿童和不同听力剥夺时期的听力技能。

方法: 将4-17岁的双侧人工耳蜗植入儿童分成三组。先天性极重度聋早期双侧组 (双侧人工耳蜗植入年龄≤3½年, n=28) 和晚期双侧组 (第一次人工耳蜗植入年龄≤3½年和第二次人工耳蜗植入年龄>3½年, N=38); 在3½岁之前具有双侧听力, 后来双耳相继极重度聋并接受双侧人工耳蜗植入儿童纳入获得/进行性组 (n=16); 听力正常组32例儿童。所有儿童均完成了声源定位和掩蔽空间声音释放的测试 (衡量双耳理解噪声中声音的能力)。

结果: 获得/进行性组儿童的定位能力比先天性聋的两组儿童的定位能力更加准确(p<0.05), 植入人工耳蜗的三组儿童的掩蔽空间声音释放测试的结果相似, 听力正常组儿童的定位能力比所有双侧人工耳蜗植入组儿童的定位能力更准确, 并且他们的掩蔽空间声音释放测试比先天性聋组儿童表现更好 (p<0.05)。

结论: 一般而言, 早期有听觉经验的双侧人工耳蜗植入儿童比先天极重度聋儿童表现出更准确的定位能力。

【关键词】 儿童; 双侧人工耳蜗植入;

What is the optimal timing for bilateral cochlear implantation in children?

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Abstract

Bilateral cochlear implants (CIs) have been provided to children who are deaf in both ears with intent to promote binaural hearing. If it is possible to establish binaural hearing with two CIs, these children would be able to make use of interaural level and timing differences to localize sound and to distinguish between sounds separated in space. These skills are central to the ability to attend to one particular sound amidst a number of sound sources. This may be particularly important for children because they are typically learning and interacting in groups. However, the development of binaural processing could be disrupted by effects of bilateral deafness, effects of unilateral CI use, or issues related to the child's age at onset of deafness and age at the time of the first and second cochlear implantation. This research aims to determine whether binaural auditory processing is affected by these variables in an effort to determine the optimal timing for bilateral cochlear implantation in children. It is now clear that the duration of bilateral deafness should be limited in children to restrict reorganization in the auditory thalamo-cortical pathways. It has also been shown that unilateral CI use can halt such reorganization to some extent and promote auditory development. At the same time, however, unilateral input might compromise the development of binaural processing if CIs are provided sequentially. Mismatches in responses from the auditory brainstem and cortex evoked by the first and second CI after a long period of unilateral CI use suggest asymmetry in the bilateral auditory pathways which is significantly more pronounced than in children receiving bilateral implants simultaneously. Moreover, behavioural responses to level and timing differences between implants suggest that these important binaural cues are not being processed normally by children who received a second CI after a long period of unilateral CI use and at older ages. In sum, there may be multiple sensitive periods in the developing auditory system, which must be considered when determining the optimal timing for bilateral cochlear implantation.

Key Words: Children; Bilateral cochlear implantation.

Article source:

Gordon K A, Jiwani S, Papsin B C. What is the optimal timing for bilateral cochlear implantation in children?[J]. Cochlear Implants International, 2011, 12 Suppl 2(sup2):S8.

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儿童双侧人工耳蜗植入的最佳时机是什么？

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【摘要】

双侧人工耳蜗植入(CIs)提供给双耳失聪的儿童以促进双耳听觉。如果使用两个人工耳蜗能够建立双侧听觉，这些儿童将能利用耳间水平差和时间差进行声源定位和区分声音方向，这些技巧对辨别很多声音中的一种特殊声音非常重要。这对儿童可能尤其重要，因为他们经常成群学习和交流。然而，双耳发育可能受双侧聋的影响，影响单侧人工耳蜗使用或与儿童耳聋年龄、第一个人工耳蜗植入的年龄及第二个人工耳蜗植入的年龄相关的问题。本研究的目的是为确定双侧听觉发育是否受这些因素的影响以便确定儿童双侧人工耳蜗的最佳植入时间。现在已经明确双侧耳聋时间应该限制在儿童听觉丘脑-皮层重组期间。同时也表明单侧人工耳蜗使用可以单侧人工耳蜗使用一定程度上可以阻止这些重组并促进听觉发育；但是如果相继植入人工耳蜗，单侧人工耳蜗植入也可能会损害双侧听觉发育。长期使用单侧人工耳蜗后，第一个和第二个植入的人工耳蜗诱发的脑干和皮层反应失匹配表明双侧听觉通路的不对称性比同时进行双侧人工耳蜗植入的儿童更显著。此外，两个耳蜗间对声音水平和时间的行为反应的差异表明这些重要的双侧线索在长期使用单侧人工耳蜗或大龄的双侧人工耳蜗植入儿童中没有得到正确处理。总之，当确定双侧人工耳蜗植入最佳时间时必须考虑到听觉系统发育过程中可能存在多重敏感期。

【关键词】 儿童；双侧人工耳蜗植入；

Bilateral versus unilateral cochlear implants in children: speech recognition, sound localization, and parental reports.

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Abstract

Objective: To compare bilateral and unilateral speech recognition in quiet and in multi-source noise, and horizontal sound localization of low and high frequency sounds in children with bilateral cochlear implants.

Design: Bilateral performance was compared to performance of the implanted side with the best monaural speech recognition in quiet result. Parental reports were collected in a questionnaire. Results from the CI children were compared to binaural and monaural performance of normal-hearing peers.

Study sample: Sixty-four children aged 5.1-11.9 years who were daily users of bilateral cochlear implants. Thirty normal-hearing children aged 4.8-9.0 years were recruited as controls.

Results and conclusions: Group data showed a statistically significant bilateral speech recognition and sound localization benefit, both behaviorally and in parental reports. The bilateral speech recognition benefit was smaller in quiet than in noise. The majority of subjects localized high and low frequency sounds significantly better than chance using bilateral implants, while localization accuracy was close to chance using unilateral implants. Binaural normal-hearing performance was better than bilateral performance in implanted children across tests, while bilaterally implanted children showed better localization than normal-hearing children under acute monaural conditions.

Key Words: Children; Bilateral cochlear implantation.

Article source:

Asp F, Mäki-Torkko E, Karltorp E, et al. Bilateral versus unilateral cochlear implants in children: Speech recognition, sound localization, and parental reports[J]. International Journal of Audiology, 2012, 51(11):817-32.

参考译文:

儿童双侧和单侧人工耳蜗植入的比较：言语识别、声源定位和家长报告

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【摘要】

目标：比较双侧人工耳蜗植入儿童在安静和多源噪声中的双侧和单侧语音识别，以及低频和高频声的水平定位。

实验设计：将双耳表现与植入人工耳蜗的听力效果较佳的单侧耳的安静下言语识别表现进行比较，采用调查问卷收集家长的反馈，并将人工耳蜗植入儿童的表现与同龄正常听力儿童的双侧和单侧听力表现进行比较。

研究样本：64例5.1-11.9岁日常使用双侧人工耳蜗的儿童。30例4.8-9.0岁正常听力的儿童作为对照组。

结果和结论：行为学和家长报告结果表明双侧言语识别和声源定位受益具有统计学显著性。安静环境下的双侧言语识别受益小于噪声下的言语识别受益。多数受试者使用双侧人工耳蜗进行高频声和低频声的定位能力好于使用单侧人工耳蜗，然而定位精度和使用单侧人工耳蜗接近。尽管双侧人工耳蜗植入儿童在敏感的单耳条件下的定位能力好于正常听力的儿童，双侧听力正常的儿童的在所有测试中的言语表现好于双侧人工耳蜗植入儿童。

【关键词】 儿童；双侧人工耳蜗植入；

The development of lateralization abilities in children with bilateral cochlear implants.

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Abstract

Objectives: The purpose of this study was to investigate the development of lateralization skills in children who received bilateral cochlear implants (CIs) in sequential operations.

Methods: The lateralization skills of 9 children with a mean age of 4.1 years at the first surgery and 5.5 years at the second surgery were assessed at 3 time intervals. Children were assessed with a 3-loudspeaker setup (front, left and right) at 0.9 years (interval I) and 1.6 years (interval II) after the second implantation, and after 5.3 years of bilateral implant use (interval III) with a 9-loudspeaker setup in the frontal horizontal plane between -90° and 90° azimuth.

Results: With bilateral implants, a significant decrease in lateralization error was noted between test interval I (45.0°) and II (23.3°), with a subsequent significant decrease at test interval III (4.7°). Unilateral performance with the CI did not improve significantly between the first 2 intervals; however, there was a bias of responses towards the unilateral side by test interval III.

Conclusions: The lateralization abilities of children with bilateral CIs develop in a relatively short period of time (1-2 years) after the second implant. Children appear to be able to acquire binaural skills after bilateral cochlear implantation.

Key Words: Lateralization skill; children; cochlear implantation.

Article source:

Kühn H, Schön F, Edelmann K, et al. The Development of Lateralization Abilities in Children with Bilateral Cochlear Implants[J]. ORL; journal for oto-rhino-laryngology and its related specialties, 2013, 75(2):55-67.

参考译文:

双侧人工耳蜗植入儿童偏侧化能力 (lateralization abilities) 的发育

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【摘要】

目标: 本研究的目的为探讨相继进行双侧人工耳蜗植入的儿童偏侧化能力的发育。

方法: 9例儿童第一次平均手术年龄4.1年, 第二次手术平均年龄5.5年, 分别在3个时间间隔对他们进行偏侧化评估, 0.9年时(时间间隔I)使用3个扬声器(前面、左面、右面)进行第一次评估, 1.6年时(时间间隔II)植入第二个人工耳蜗后进行第二次评估, 5.3年时(时间间隔III)使用9个呈水平面-90°至90°方位角前置摆放的扬声器对双侧人工耳蜗使用进行第三次评估。

结果: 使用双侧人工耳蜗时, 测试间隔I(45.0°)和II(23.3°)的偏侧化误差显著减小, 随后在测试间隔III(4.7°)显著减小。在前两次间隔测试时, 单侧人工耳蜗的表现没有显著改善, 然而在第三次间隔测试时单侧方面存在反应偏倚。

结论: 双侧人工耳蜗植入的儿童在进行第二个人工耳蜗植入术后相对短的时间内(1-2年)发育了偏侧化能力, 这些儿童看起来在第二次人工耳蜗植入术后能够获取双耳听力技巧。

【关键词】 偏侧化能力; 儿童; 人工耳蜗植入;

Language and speech perception of young children with bimodal fitting or bilateral cochlear implants.

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Abstract

Objectives: This paper compares language development and speech perception of children with bimodal fitting (a cochlear implant in one ear and a hearing aid in the opposite ear) or bilateral cochlear implantation.

Methods: Participants were children enrolled in the Longitudinal Outcomes of Children with Hearing Impairment study. Language development was assessed at 3 years of age using standardized tests. Speech perception was evaluated at 5 years of age. Speech was presented from a frontal loudspeaker, and babble noise was presented either from the front or from both sides.

Results: On average, there was no significant difference in language outcomes between 44 children with bimodal fitting and 49 children with bilateral cochlear implants; after controlling for a range of demographic variables. Earlier age at cochlear implant activation was associated with better outcomes. Speech perception in noise was not significantly different between children with bimodal fitting and those with bilateral cochlear implants. Compared to normal-hearing children, children with cochlear implants required a better signal-to-noise ratio to perform at the same level, but demonstrated spatial release from masking of a similar magnitude.

Conclusions: This population-based study found that language scores for children with bilateral implants were higher than those with bimodal fitting or those with unilateral implants, but neither reached significance level.

Key Words: Bilateral implants; Bimodal fitting; Children; Language; Spatial release from masking.

Article source:

Ching T Y, Day J, Van B P, et al. Language and speech perception of young children with bimodal fitting or bilateral cochlear implants[J]. Cochlear Implants International, 2014, 15(sup1):S43-S46.

参考译文:

双侧调试或双侧人工耳蜗植入的青少年的语言和言语识别

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【摘要】

目的: 本文比较双模调试 (一侧佩戴人工耳蜗一侧佩戴助听器) 和双侧人工耳蜗植入者的儿童的语言发育和言语感知。

方法: 研究对象为参加听障儿童康复效果的纵向研究的儿童。使用标准化测试评估3岁时的语言发育情况, 5岁时评估言语感知情况。言语声从前面的扬声器播放, 多重噪声从前面或者两侧播放。

结果: 一般而言, 控制样本特征后, 44例双模调试和49例双侧人工耳蜗植入的儿童的语言结果没有显著性差异。人工耳蜗开机的年龄越小术后效果越好。双模式调试和双侧人工耳蜗植入的儿童在噪声下的言语识别结果没有显著性差异。与正常听力的儿童相比, 佩戴人工耳蜗的儿童在相同水平需要更高的信噪比, 但是表现出差不多大小的掩蔽空间。

结论: 这项基于人群的研究发现双侧植入人工耳蜗的儿童的语言成绩高于双模式调试或那些单侧人工耳蜗植入儿童, 但是未达到显著水平。

【关键词】 双侧植入; 双模调试; 儿童; 语言; 掩蔽空间释放.

The effectiveness of bilateral cochlear implants for severe-to-profound deafness in adults: a systematic review.

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Abstract

Objective: Assessment of the clinical effectiveness of bilateral cochlear implantation compared with unilateral cochlear implantation or bimodal stimulation, in adults with severe-to-profound hearing loss. In 2007, the National Institute for Health and Clinical Excellence (NICE) in the U.K. conducted a systematic review on cochlear implantation. This study forms an update of the adult part of the NICE review.

Data sources: The electronic databases MEDLINE and Embase were searched for English language studies published between October 2006 and March 2011.

Study selection: Studies were included that compared bilateral cochlear implantation with unilateral cochlear implantation and/or with bimodal stimulation, in adults with severe-to-profound sensorineural hearing loss. Speech perception in quiet and in noise, sound localization and lateralization, speech production, health-related quality of life, and functional outcomes were analyzed.

Data extraction: Data extraction forms were used to describe study characteristics and the level of evidence.

Data synthesis: The effect size was calculated to compare different outcome measures.

Conclusion: Pooling of data was not possible because of the heterogeneity of the studies. As in the NICE review, the level of evidence of the included studies was low, although some of the additional studies showed less risk of bias. All studies showed a significant bilateral benefit in localization over unilateral cochlear implantation. Bilateral cochlear implants were beneficial for speech perception in noise under certain conditions and several self-reported measures. Most speech perception in quiet outcomes did not show a bilateral benefit. The current review provides additional evidence in favor of bilateral cochlear implantation, even in complex listening situations.

Key Words: Bilateral cochlear implantation; Systematic review.

Article source:

Van S J, Sparreboom M, van Zanten B G, et al. The effectiveness of bilateral cochlear implants for severe-to-profound deafness in adults: a systematic review.[J]. *Otology & neurotology* : official publication of the American Otological Society, American Neurotology Society [and] European Academy of Otology and Neurotology, 2013, 34(2):190-8.

参考译文：

成人重度极重度聋双侧植入人工耳蜗的术后效果：系统综述

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【摘要】

目的：成人重度极重度聋双侧植入人工耳蜗与单侧植入人工耳蜗或双模式刺激的临床效果评估。2007年，英国国家健康与临床卓越（NICE）研究所进行了一项人工耳蜗植入术的系统综述，本研究更新这项研究的成人综述部分。

数据来源：检索电子数据库MEDLINE和Embase中2006年10月至2011年3月发表的英文研究。

文献筛选：研究纳入标准为比较成人重度极重度感音神经性聋双侧植入人工耳蜗与单侧植入人工耳蜗或双模式刺激，分析安静和噪声下的言语识别、声音定位和定侧、说话、健康相关的生活质量、功能结果。

数据提取：使用数据提取表来描述研究特征和证据水平。

数据合成：计算效应大小比较不同的结果测量。

结论：由于研究间的异质性，不能进行数据合并。正如NICE综述，尽管存在一些较小风险偏倚的研究，纳入研究的证据水平比较低。所有研究均显示在定位方面双侧人工耳蜗植入相对于单侧人工耳蜗植入具有明显的优势；在特定情况下和一些自述报告测试中双侧人工耳蜗植入具有噪声下的言语识别方面的优势；在安静环境下的多数言语测试中双侧人工耳蜗植入没有显示出显著受益。本研究为双侧人工耳蜗植入提供了更多支持证据，即便是复杂听声环境下。

【关键词】 双侧人工耳蜗植入；系统综述.

人工耳蜗双侧植入的优势

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【摘要】

正常人群依赖双侧听觉。相对于单侧听觉，双侧听觉优势如下：噪音背景下更佳的言语识别能力，更佳的高频信号识别能力及声源定位能力。在同一环境中，双耳听力显然比单耳听力更具优势，不需要特别的注意力就能达到随意畅通的目的。在通常情况下，双耳的“立体声”听力要比单耳的“单声道”听力更省力。

【关键词】 人工耳蜗植入；识别能力；听觉效果；定位能力；儿童；双侧；正常人群；残余听力；优势；感音神经性聋。

文章来源: 吴佩娜. 人工耳蜗双侧植入的优势[J]. 人人健康, 2013(21).

双侧人工耳蜗植入者在噪声环境下的言语辨别能力

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【摘要】

目的：探讨双侧人工耳蜗植入患者的言语辨别能力。**方法：**用2例双侧人工耳蜗植入者比较双侧与单侧人工耳蜗在不同信噪比下对广东话声调的辨别能力。**结果：**在+15、+10和+5的信噪比下，双侧人工耳蜗的平均能力为96%、92%和88%，而左耳及右耳单侧人工耳蜗的平均成绩为86%、83%和74%。在0、-5、-10及-15的信噪比下，单侧人工耳蜗的平均能力近于0%，而双侧人工耳蜗的平均成绩为80%、72%、68%和54%。**结论：**在不同信噪比下，双侧人工耳蜗植入更有助于提高对广东话声调的辨别能力，进一步证明了双侧人工耳蜗植入患者运用双耳听力的优势。

【关键词】 听力障碍；耳蜗植入；言语识别测验；噪声；

文章来源：

区建国, 金昊, 许由, 等. 双侧人工耳蜗植入者在噪声环境下的言语辨别能力[J]. 中华耳鼻咽喉头颈外科杂志, 2001, 36(6):433-435.

双侧人工耳蜗植入术后言语识别效果的评估

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【摘要】

目的 评估双侧人工耳蜗植入者汉语普通话短句、双音节词单音节词及汉语声调的识别效果,探索双侧人工耳蜗植入者双耳听觉产生的机制及对言语识别率的影响。**方法** 选取双侧人工耳蜗植入患者6人,自制问卷收集受试者的基本信息并评估他们的主观听觉状况。首先测试受试者在使用双侧人工耳蜗(BCI)、单独使用一侧人工耳蜗(RCI/LCI)的听阈,随后测试他们在BCI和RCI/LCI两种听觉模式下的七音节短句、双音节词、声调、韵母、声母识别率,测试背景环境包括安静环境和嘈杂语噪声环境,言语信号强度为65dB SPL,固定信噪比为+10 dB SPL。随后将BCI和RCI/LCI两种听觉模式下的识别效果进行比较。**结果** 除噪声状态下韵母识别测试中其余测试结果均为BCI言语识别率得分高于RCI/LCI。**结论** 对于符合双侧人工耳蜗植入术适应证标准的患者而言,双侧植入人工耳蜗可以在不同程度上提高安静和噪声环境下的短句、双字词、声母、韵母及声调的识别率,降低其声场听阈。

【关键词】 人工耳蜗; 双耳听觉; 言语识别。

文章来源: 崔丹默,王顺成,石颖,等. 双侧人工耳蜗植入术后言语识别效果的评估[J]. 中华耳科学杂志, 2013(2):181-184.

双侧人工耳蜗植入对儿童听觉识别能力影响的个案研究

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【摘要】

目的: 考察双侧和单侧配戴人工耳蜗对儿童听觉识别的影响。**方法:** 本研究采用实验法和观察法。通过实验法在安静环境下使用听觉评估导航系统对幼儿的双耳和单耳进行测试。识别材料主要选择韵母识别、声母识别、单音节词声调识别、双音节词识别、短句识别。言语信号的强度为70dB SPL。通过观察法观察儿童在日常生活中双耳和单耳的表现,考察双耳与单耳在日常生活中的差异。**结果:** 实验结果表明,在声调识别和双音节词识别方面,该儿童识别率都达到100%。在韵母方面,双侧略好于单侧。在声母识别和短句识别方面,双侧人工耳蜗的语音识别率远高于单侧。在日常生活中,儿童双侧配戴人工耳蜗比单侧的言语识别率、听觉定向都要好。**结论:** 双侧人工耳蜗提高了患者的言语识别率,尤其体现在声母识别和短句识别方面。

【关键词】 人工耳蜗; 听觉识别; 双耳听觉;

文章来源: 刘巧云,黄昭鸣,孙喜斌,等. 双侧人工耳蜗植入对儿童听觉识别能力影响的个案研究[J]. 中国听力语言康复科学杂志, 2008(1):51-53, 36(6):433-435.

双侧人工耳蜗植入患者早期言语识别率的特点

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【摘要】

目的 通过对两例双侧人工耳蜗植入患者早期言语识别率的分析,探讨双侧人工耳蜗植入对言语识别率的影响及中枢对双侧信号的处理机制。方法 2例先天性聋的双侧人工耳蜗植入的患儿参与测试。第二次植入术后一个月开机时,分别测定双耳、左耳、右耳对数字、单字词、双字词的言语识别率。结果 新近植入侧单独开机时,各种方法下的言语识别率均为零。分别采用数字、单字词、双字词测试获得的言语识别率各不相同,其差异有显著性($p < 0.01$)。双侧同时开机可以明显提高患儿对双字词的识别率,但对数字和单字词的影响不大。在对1例患儿不同时期的言语识别率的观察中,随着双侧人工耳蜗使用时间的延长,无论先植入耳、后植入耳及双耳的言语识别率均有所提高。结论 对数字、单字词、双字词的中枢识别机制有所不同,每一种单独方法都不能完整反映受试者的实际言语听觉能力。证实了双侧人工耳蜗植入术可以明显提高患者的言语识别率;接受双侧人工耳蜗植入术的患者双耳听力效应的重建需要一个重新学习和适应的过程。而耳蜗植入后听力训练则在其中起着极为重要的作用。

【关键词】 耳蜗植入; 言语识别率.

文章来源: 夏瑞明, 余力生, 马鑫. 双侧人工耳蜗植入患者早期言语识别率的特点[J]. 中国听力语言康复科学杂志, 2003(1):32-33.

汉语语后聋患者双侧人工耳蜗植入一例

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【摘要】

目的: 人工耳蜗主要是帮助通过助听器得不到有效补偿,不能满足听觉和言语交流目的的重度听力障碍人群。对于健听者,双耳聆听较单耳聆听时具有声音信号更清晰饱满,提高噪声环境时的交流能力和对声源定位等优点。然而目前绝大多数人工耳蜗是单侧植入,且非植入耳使用助听器效果很差。因此如何进一步提高言语交流能力,特别是在噪声环境时及对声源定位等是亟待解决的问题。我们通过对1例语后聋患者双侧人工耳蜗植入后的言语识别研究,试图阐述汉语使用者双侧人工耳蜗植入后的编程调试,对可能收益及其机制进行分析。

【关键词】 人工耳蜗植入; 噪声环境; 信噪比; 声源定位; 受试者; 声音信号; 交流能力; 言语识别;

文章来源: 魏朝刚, 曹克利, 曾凡钢, 等. 汉语语后聋患者双侧人工耳蜗植入一例[J]. 中华耳鼻咽喉头颈外科杂志, 2007, 42(6):468-469.

双侧同期人工耳蜗植入效果分析

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【摘要】

目的 使用听觉和言语问卷分级的方法评估双侧耳人工耳蜗同期植入患者的听觉与言语康复疗效。**方法** 依据诺丁汉大学提出的听觉行为分级标准(categories of auditory performance, CAP)和言语可懂度分级标准(speech intelligibility rating, SIR), 截止到2007年5月, 对5例双耳同期人工耳蜗植入患者家长与仅行单侧人工耳蜗植入对照组家长进行问卷调查。**结果** 五例双侧人工耳蜗同期植入患者的CAP分别为:8、7、7、6、3, SIR分别为:5、5、4、2、1。

【关键词】 双侧; 人工耳蜗; 同期植入。

文章来源: 韩德民, 李永新, 郑军, 等. 双侧同期人工耳蜗植入效果分析[C]//中华医学会第十次全国耳鼻咽喉-头颈外科学术会议论文汇编(上). 2007.

人工耳蜗对语后聋患者双侧耳鸣的影响

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【摘要】

目的 观察人工耳蜗植入对语后聋患者双侧耳鸣的影响, 探讨人工耳蜗植入治疗耳鸣的可行性。**方法** 对32例(64耳)术前双侧耳鸣语后聋人工耳蜗植入者(男13例, 女19例; 31例单侧植入, 1例双侧植入)进行术前、术后耳鸣问卷调查评估。测试材料采用耳鸣残疾评估量表(Tinnitus Handicap Inventory, THI), 同时记录患者耳鸣的特征, 分析植入同侧及对侧耳鸣术前术后响度的变化情况, 并观察人工耳蜗开机工作和关机两种状态对耳鸣响度的影响。采用SPSS18.0软件进行数据统计分析。**结果** 22例患者(71.0%)术后THI得分比术前下降 ≥ 20 分。术前THI总分平均为(56.4 \pm 18.1)分, 术后THI总分平均为(24.7 \pm 22.7)分, 经配对t检验分析, 得分手术前后差异具有统计学意义($t=8.037$, $P<0.05$)。患者术后未开机情况下, 同侧耳鸣81.9%(27/33)减弱或消失, 18.2%(6/33)响度未变, 无响度加重情况出现; 对侧耳鸣71.0%(22/31)术后减弱或消失, 16.1%(5/31)响度未变, 12.9%(4/31)响度加重。在开机状态下, 同侧耳鸣97.0%(32/33)减弱或消失, 对侧耳鸣83.9%(26/31)减弱或消失。**结论** 人工耳蜗植入对语后聋耳鸣患者的耳鸣症状具有较好的抑制作用, 但也存在耳鸣加重的风险。

【关键词】 耳蜗植入术; 耳鸣; 问卷调查;

文章来源: 韩王倩, 于丽玫, 张超, 等. 人工耳蜗对语后聋患者双侧耳鸣的影响[J]. 中华耳鼻咽喉头颈外科杂志, 2015, 50(4):268-273.

双侧人工耳蜗植入技术

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【摘要】

进入21世纪以来,人工耳蜗植入术已经让千千万万的聋人重返有声世界,而双侧人工耳蜗植入技术的开展,则让人工听觉更加精细完美。国外双侧人工耳蜗植入技术的研究已有近20年的时间,但国内相关技术的系统报道尚罕见。本文通过对双侧人工耳蜗植入技术的一些特点、热点的介绍,向人们展示这一新技术的发展现状。

【关键词】 耳蜗(Cochlear); 耳蜗植入术(Cochlear Implantation).

文章来源:

马泓智,李永新,韩德民.双侧人工耳蜗植入技术[J].国际耳鼻咽喉头颈外科杂志,2007,31(6):363-365.

双侧植入人工耳蜗对儿童选择性听取能力影响的个案研究

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【摘要】

目的 探讨双侧人工耳蜗植入儿童在噪音环境下的选择性听取能力。**方法** 采用实验法,研究个案在不同信噪比条件(SNR=0, 10, 20)下,单、双侧耳识别双音节词和短句的能力。测试使用计算机导航系统给声。**结果** 在双音节词识别方面,当SNR=20和SNR=10时,单、双耳的识别率都为100%;但当SNR=0时,单、双耳识别率同时下降,结果较为接近。在短句识别方面,SNR=20和SNR=10时的结果相似,但单、双耳之间的差异较为明显;当SNR=0时,单、双耳识别率同时下降,结果较为接近。**结论** 双侧人工耳蜗提高了该儿童在背景噪声中的选择性听取技能。SNR=20和SNR=10时,单耳和双耳的选择性听取能力都没有显著差异,但双耳明显好于单耳。在SNR=0时,单耳和双耳的选择性听取能力明显下降,且双耳和单耳差异缩小。

【关键词】 双侧人工耳蜗; 选择性听取;

文章来源:

刘巧云,孙喜斌,张蕾,等.双侧植入人工耳蜗对儿童选择性听取能力影响的个案研究[J].中国听力语言康复科学杂志,2009(2):54-56.

双耳双模式聆听的优势及目前存在的问题

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【摘要】

近十年来, 人工耳蜗植入已经成为治疗小儿和成人重度以上感音性神经性聋的标准疗法.但在耳聋患者中存在这样一群特殊患者, 他们一侧耳重度或极重度聋, 但对侧耳尚有一定的残余听力。在中国大多数此类患者接受了单侧人工耳蜗植入, 形成了单耳听觉。然而对于这些患者, 其单侧人工耳蜗植入在其音调、音乐感知以及声源定位等能力并没有达到理想状态, 是以针对那些对侧耳有残余听力的单侧人工耳蜗植入者, 出现了给非植入耳佩戴助听器的“双耳双模装配”模式, 从而使患者能够“双耳双模式聆听”。那么相对于单耳听觉或双耳耳蜗模式究竟有何优势, 并且就目前的研究或是技术而言, 还存在哪些主要的问题呢? 本文在回顾近年文献的基础上, 对这些问题做一综述。

【关键词】 人工耳蜗植入; 儿童; 双侧; 双模式; 优势; 感音神经性聋.

文章来源:

钟梅, 邱建新. 双耳双模式聆听的优势及目前存在的问题[J]. 国际耳鼻咽喉头颈外科杂志, 2017, 41(4).

双耳双模式助听患者汉语普通话声调识别特征

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【摘要】

目的 比较双耳双模式助听患者在安静环境和不同背景噪声下的声调识别率, 探讨不同信噪比和不同基频噪声下的双模式优势。**方法** 12例一侧植入人工耳蜗、对侧佩戴助听器[双模式 (CIHA)]的汉语普通话患者参加本研究, 所有患者双模式使用时间均为半年以上。使用天使语训i-CAST测试软件的人工耳蜗科研项目模块, 采用封闭式测试方法, 分别测试受试者在安静环境和不同背景噪声环境下单独使用人工耳蜗 (CI)、单独使用助听器 (HA) 和双模式下 (CIHA) 的声调识别率, 测试环境包括安静环境、男信号男背景、男信号女背景三种, 每种背景噪声包含10、5和0dB三种信噪比 (以下将6种背景噪声简称为男男10、男男5、男男0、男女10、男女5和男女0), 即每位患者进行21组测试; 每组分别测试/Ba/、/Bi/、/Bo/、/Bu/4个音的一、二、三、四4个声调; 测试声通过扬声器发出, 强度为65dB SPL; 记录患者上述三种模式下的助听听阈及助听侧裸耳听阈。**结果** 患者在CIHA与CI模式下的助听听阈差异无统计学意义 ($P > 0.05$), 但均与HA模式和非植入侧的裸耳听阈差异有统计学意义 ($P < 0.05$)。声调识别率受背景环境的显著影响 ($F=24.77, P < 0.001$), 安静环境、男男5和男男0背景噪声环境下双模式无明显优势 ($P > 0.05$), 在男男10、男女10、男女5和男女0背景噪声环境下双模式均有显著优势 (P 值分别为0.010, 0.012, 0.015和0.001)。**结论** 本组患者在安静环境下的声调识别双模式无显著优势, 信号声与背景噪声基频不同时, 双模式优势显著。

【关键词】 双模式; 人工耳蜗植入; 助听器; 声调识别;

文章来源:

魏兴梅, 拱月, 陈彪, 等. 双耳双模式助听患者汉语普通话声调识别特征[J]. 听力学及言语疾病杂志, 2017, 25(2):180-185.

词汇

词汇

Asymmetry
Azimuth
Behavioural
Bimodal
Compromise
Congenital
Electrophysiological
Horizontal plane
Impair
Lateralization
Mismatch
Multiple
Progressive
Pronounced
Reorganization
Sensitive periods
Sequentially
Simultaneously
Subsequently
Symmetrical

翻译

不对称的, 不对等的
方位角
动作的
双峰的, 双模式
妥协、损害
先天性; 先天的, 天生的
电生理学的
水平面
损害, 削弱
偏侧性, 偏侧优势, 偏利
错配, 失谐
多重的; 复杂的; 多功能的
进步的; 进行的;
显著的; 断然的; 强硬的;
重组
敏感期
相继, 序贯, 从而
同时地
其后, 随后, 接着
对称性

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