

Progetto: Supporto all'attività di ricerca della Unità Operativa di Otorinolaringoiatria, per il triennio 2021-2023

Responsabile: Dr. Domenico Cuda

Costo del progetto: 20.000 euro/anno (triennio 60.000 euro)

- 20.000 euro per acquisizione risorse umane
- 20.000 euro per acquisto attrezzature e strumentazioni
- 20.000 euro per la divulgazione dell'attività di ricerca alla comunità scientifica (attraverso mezzi opportuni)

Il costante orientamento alla ricerca scientifica, concretizzatosi sempre con regolari e rilevanti pubblicazioni su riviste indicizzate, è uno dei punti qualificanti della mission dell'UO di Otorinolaringoiatria. La ricerca scientifica di buona qualità, infatti, è un fattore che può contribuire al raggiungimento dell'eccellenza clinica. Per tali ragioni, a completamento di un triennio molto produttivo si è progettato un nuovo piano triennale (2021-2023) in ambito audiologico-riabilitativo incentrato sui seguenti aspetti:

- Percezione del parlato e fatica uditiva in condizioni d'ascolto difficile
- Sviluppo del linguaggio nei bambini ipoacusici
- Impatto della sordità e della sua rimediazione nel paziente anziano
- Valutazione di nuove tecnologie per l'ascolto
- Ottimizzazione percorsi chirurgici in otologia si darà un particolare rilievo al filone di valutazione del „listening effort“ con differenti approcci sia soggettivi sia oggettivi e in particolare:
 - ✓ Valutazione pupillometrica del listening effort
 - ✓ Valutazione della funzione uditiva mediante imaging funzionale
 - ✓ Analisi spettrografica dell'attività elettroencefalografica in ambito audiologico (listening effort, acufeni)

Tali aree sono oggetto di specifici progetti di ricerca. Molti di essi sono svolti in collaborazione con altre istituzioni. Ogni progetto di ricerca è obbligatoriamente sottoposto al vaglio del Comitato Etico locale ed è eseguito in base agli standard qualitativi internazionali della ricerca clinica (ICH/GCP). Di seguito sono riportati alcuni degli studi pubblicati nel corso del triennio (al 29/10/2023).

STUDI PUBBLICATI NELL'ANNO 2021

1/7 (2021) - Postoperative Benefit of Bone Anchored Hearing Systems: Behavioral Performance and Self-Reported Outcomes.

Domenico Cuda, Alessandra Murri, Paolo Mochi, Anna Mainardi

Int Arch Otorhinolaryngol 2021. Published online: 2021-10-19 DOI <https://doi.org/10.1055/s-0040-1718959>. ISSN 1809-9777

Abstract

Introduction: Bone anchored hearing solutions are a well-known option for patients with a conductive, mixed conductive-sensorineural hearing loss and those with single-sided deafness.

Objective: The aim of the present study was to evaluate the Ponto bone-anchored hearing system in terms of behavioral performance and self-reported outcomes, by comparing unaided and aided

performance (softband and abutment), as well as aided performance with the sound processor on softband (preoperatively) versus abutment (postoperatively).

Methods: Fourteen adult bone-anchored candidates, with either a bilateral (n = 12) or unilateral (n = 2) conductive or mixed hearing loss, participated in the present study. Sound-field hearing thresholds were evaluated unaided and aided (softband and abutment). A speech-in-noise test was also performed unaided and aided for two spatial configurations (S0N90; implanted side; S0N90; nonimplanted side). The Glasgow Health Status Inventory and the Speech, Spatial and Quality of sound questionnaires were administered pre- and postsurgery to compare quality of life and perceived unaided and aided performance. Skin reaction (Holgers scores) was evaluated at 15 days, 6 weeks, and 10 weeks after surgery.

Results: Significant improvements postoperatively relative to unaided were obtained for sound-field thresholds at all tested frequencies. Additionally, sound-field thresholds were significantly improved with the sound processor on abutment relative to the softband at frequencies > 1 kHz. Improved performance postoperatively relative to unaided was also obtained in the speech-in-noise test and in self-reported outcomes.

Conclusions: Improvements in behavioral performance and self-reported outcomes were obtained with the sound processor mounted on abutment.

2/7 (2021) - Comparison between linear incision and punch techniques for bone anchored hearing aid surgery.

Sabrina De Stefano, Paolo Mochi, Alessandra Murri, Domenico Cuda
Acta Otorhinolaryngol Ital. 2021 Oct;41(5):474-480. doi: 10.14639/0392-100X-N1048

Abstract

Objectives: To evaluate mean surgical time, incidence of soft tissue reactions, implant survival and intraoperative complications in both minimally invasive ponto surgery (MIPS) and the linear incision with tissue preservation technique (LT).

Methods: A retrospective review was carried out on 48 bone anchored hearing system (BAHS) patients between 2014 and 2019: 13 patients had undergone LT and formed one group, while 35 patients had undergone MIPS and formed the second group. Mean surgical time, intraoperative complications, implant loss and skin reaction were assessed at each post-operative examination. The Mann-Whitney U test was used for statistical analysis. Results: The difference in the mean surgical time of 15 mins for MIPS and 36 mins for LT was statistically significant. No intraoperative complications were reported and implant survival was 100% in both groups. The incidence of adverse skin reactions was 7.7% for the LT group and 0% for the MIPS group at first follow-up examination.

Conclusions: Surgical mean time is shorter for MIPS, making this procedure more suitable for local anaesthesia and more cost effective. Moreover, both LT and MIPS demonstrate good surgical outcomes in terms of skin reactions according to Holgers score and equally excellent implant survival

3/7 (2021)- Do Acoustic Environment Characteristics Affect the Lexical Development of Children with Cochlear Implants? A Longitudinal Study Before and After Cochlear Implant Activation.

Marinella Majorano, Margherita Brondino, Letizia Guerzoni, Alessandra Murri, Rachele Ferrari, Manuela Lavelli, Domenico Cuda, Christine Yoshinaga-Itano, Marika Morelli, Valentina Persici
Am J Audiol. 2021 Sep 10;30(3):602-615. doi: 10.1044/2021_AJA-20-00104. Epub 2021 Jun 17

Abstract

Purpose: This study investigates the acoustic environment of children with cochlear implants (CIs) and the relationship between exposure to speech, in noise and in quiet, and the children's lexical production up to 1 year after CI activation, while controlling for the effect of early individual differences in receptive vocabulary growth.

Method: Eighteen children with CIs were observed at 3, 6, and 12 months after CI activation. Children's spontaneous word production during interaction with their mothers (types and tokens) and their expressive and receptive vocabulary size were considered. The characteristics of the acoustic environments in terms of acoustic scenes (speech in noise or in quiet, quiet, noise, music, and other) and of loudness ranges were assessed using data logging of the children's devices.

Results: Data analysis showed that both the number of tokens and the number of types produced 1 year after CI activation were affected by the children's exposure to speech in quiet with a loudness

range between 40 and 69 dB. Expressive vocabulary size and types were affected by the receptive vocabulary knowledge that the children achieved over the first 3 months after CI activation. Conclusions: Our data support the role of speech environment and individual differences in early comprehension on lexical production. The importance of exposure to speech with particular characteristics for the lexical development of children with CIs and the implications for clinical practice are discussed.

4/7 (2021)- Objective assessment of the “listening effort” in audiology.

Sara Ghiselli, Domenico Cuda

Otorhinolaryngology 2021. September;71(3):172-80 DOI: 10.23736/S2724-6302.21.02373-2

Abstract

It is well known that subjects with hearing loss not only have a deficiency in peripheral auditory sensitivity, but they can also experience detrimental consequences in different functional domains. “Listening effort” is one of the more promising ways of explaining part of the variation in these real-life consequences. This review focuses on evidence which is the gold standard for the objective measurement of listening effort in clinical practice. The limitations and benefits of the different tools and the applicability in evaluation of subjects with HL are described. English language articles were identified through systematic searches in PubMed and in the Cochrane Library. Peer-reviewed research articles were included from inception until the present. References of eligible studies were checked. The Population, Intervention, Control, Outcomes, and Study design strategy were used to create inclusion criteria for relevance. Initial searches for research produced unique articles after removal of duplicates. After selection, cross-reference checking, and review for clinical relevance, 64 studies met the inclusion criteria for this review. This review emphasizes that there is no consensus on a gold standard measurement of listening effort because multiple domains influence this experience. The best clinical practice suggests using different types of measurement in order to capture different cognitive aspects. Furthermore, different setup elements can influence methodologies for assessing listening effort. In particular, the experimental setups applied, the stimuli used, the HL degree, and the age of participants are significant elements in listening effort studies.

5/7 (2021)- Evaluation of the efficacy of hearing aids in older adults: a multiparametric longitudinal study protocol.

Domenico Cuda, Sara Ghiselli, Alessandra Murri

BMC Geriatr 2021. Feb 5;21(1):107. doi: 10.1186/s12877-021-02033-z

Abstract

Background: Prevalence of hearing loss increases with age. Its estimated prevalence is 40-50 % in people over 75 years of age. Recent studies agree that decline in hearing threshold contribute to deterioration in sociality, sensitivity, cognition, and quality of life for elderly subjects. The aim of the study presented in this paper is to verify whether or not rehabilitation using first time applied Hearing Aids (HA) in a cohort of old people with hearing impairment improves both speech perception in a noisy environment over time and the overall health-related quality of life.

Methods: The monocentric, prospective, repeated measurements, single-subject, clinical observational study is to recruit 100 older adults, first-time HA recipients (≥ 65 years). The evaluation protocol is designed to analyze changes in specific measurement tools a year after the first HA usage in comparison with the evaluation before HA fitting. Evaluations will consist of multiparametric details collected through self-report questionnaires completed by the recipients and a series of commonly used audiometric measures and geriatric assessment tools. The primary indicator of changes in speech perception in noise to be used is the Italian version of Oldenburg Satz (OLSA) test whereas the indicator of changes in overall quality of life will be the Assessment of Quality of Life (AQoL) and Hearing Handicap Inventory for the Elderly (HHIE) questionnaires. The Montreal Cognitive Assessment (MoCA) will help in screening the cognitive state of the subjects.

Discussion: The protocol is designed to make use of measurement tools that have already been applied to the hearing-impaired population in order to compare the effects of HA rehabilitation in the older adults immediately before first HA usage (Pre) and after 1 year of experience (Post). This broad approach will lead to a greater understanding of how useful hearing influences the quality of life in older individuals, and therefore improves potentials for healthy aging. The data is to be analyzed by using an intrasubject endpoint comparison. Outcomes will be described and analyzed in detail.

6/7 (2021)- Variables influencing executive functioning in preschool hearing-impaired children implanted within 24 months of age: an observational cohort study.

Maria Nicastrì, Ilaria Giallini, Martina Amicucci, Laura Mariani, Marco de Vincentiis, Antonio Greco, Letizia Guerzoni, Domenico Cuda, Giovanni Ruoppolo, Patrizia Mancini
Eur Arch Otorhinolaryngol 2021 Aug;278(8):2733-2743. doi: 10.1007/s00405-020-06343-7

Abstract

Purpose: Executive Functions (EFs) are fundamental to every aspect of life. The present study was implemented to evaluate factors influencing their development in a group of preschools orally educated profoundly deaf children of hearing parents, who received CI within 2 years of age. **Methods:** Twenty-five preschool CI children were tested using the Battery for Assessment of Executive Functions (BAFE) to assess their flexibility, inhibition, and non-verbal visuo-spatial working memory skills. The percentage of children performing in normal range was reported for each of the EF subtests. Mann-Whitney and Kruskal-Wallis were performed to assess differences between gender, listening mode, and degree of parents' education subgroups. The Spearman Rank Correlation Coefficient was calculated to investigate the relationship between EF scores of audiological and linguistic variables. **Results:** Percentages ranging from 76 to 92% of the children reached adequate EF scores at BAFE. Significant relations ($p < 0.05$) were found between EFs and early intervention, listening, and linguistic skills. Furthermore, CI children from families with higher education level performed better at the response shifting, inhibitory control, and attention flexibility tasks. Economic income correlated significantly with flexibility and inhibitory skills. Females performed better than males only in the attention flexibility task.

Conclusions: The present study is one of the first to focus attention on the development of EFs in preschool CI children, providing an initial understanding of the characteristics of EFs at the age when these skills emerge. Clinical practice must pay increasing attention to these aspects which are becoming the new emerging challenge of rehabilitation programs.

7/7 (2021)- Binaural hearing restoration with a bilateral fully implantable middle ear implant

Domenico Cuda, Alessandra Murri, Anna Mainardi, Francesca Forli, Stefano Berrettini, Luca Bruschini

Eur Arch Otorhinolaryngol 2021 Jul;278(7):2239-2246. doi: 10.1007/s00405-020-06290-3

Abstract

Aim: The fully implantable middle ear implant (C-FI-MEI) is designed for patients with moderate-to-severe sensorineural hearing loss or those with mixed hearing loss. To analyze the audiological post-operative results of subjects bilaterally implanted with C-FI-MEI.

Materials and methods: Retrospective study: 14 patients with bilateral, moderate-to-severe, sensorineural or mixed hearing loss were treated. This clinical sample included 14 cases bilaterally implanted (13 sequentially, 1 simultaneously). The evaluation at each follow-up after surgery included otologic examination, a structured interview, and different audiological tests composed of pure tone audiometry, speech in quiet and in noise test, and localization task. The mean follow-up was 67.2 ± 33 months.

Results: There were no significant differences between pre and post-operative pure tone averages. The patients showed no significant differences between pre-operatively aided and C-FI-MEI implant-aided conditions in terms of word recognition score. Speech perception in noise under different loudspeaker arrangements and localization tests demonstrated a binaural advantage in bilaterally implanted patients. The mean daily use time was 17.4 and 16.7 h, respectively, for right and left side.

Conclusion: The results for the 14 patients, bilaterally implanted with C-FI-MEI, suggest that bilateral implantation of fully implantable middle ear hearing devices is an effective procedure.

STUDI PUBBLICATI NELL'ANNO 2022

1/6 (2022)- Auditory evaluation of infants born to COVID19 positive mothers.

Sara Ghiselli, Andrea Laborai, Giacomo Biasucci, M Carvelli, Daria Salsi, Domenico Cuda.

Am J Otolaryngol. 2022 Feb 5;43(2):103379. doi: 10.1016/j.amjoto.2022.103379

Abstract

COVID-19 infection can cause a wide spectrum of symptoms. The audio-vestibular system can also be involved, but there is still debate about this so findings need to be considered carefully. Furthermore, mother to fetus intrauterine transmission of COVID-19 infection in pregnant women is controversial. Few studies are available about the audio-vestibular symptomatology of newborns with intrauterine COVID19 exposure.

Objectives: This study investigates the possible correlation between the COVID19 gestational infection and hearing impairment onset in newborns. The involvement of hearing in COVID19 is verified so the timing and methodology of audiological evaluation of children can be planned.

Methods: Children were subject to newborn hearing screening and audiological evaluation. Newborn hearing screening is carried out prior to hospital discharge using the Automatic Transient Evoked Otoacoustic Emissions test. Audiological evaluation is performed within the child age of 4 months by using maternal, pregnancy, and perinatal case history, COVID19 case history, otoscopy, acoustic immittance test, Distortion Product Otoacoustic Emissions test, and the Auditory Brainstem Response test.

Results: 63 children were included in the study. 82.5% of these children were subjects of the newborn hearing screening program. The remaining 11 newborns were not subjected to hearing screening due to isolation measures and their audiological evaluation was carried out directly. Only one of 52 screened neonates showed a bilateral REFER test result but hearing threshold was normal at audiological evaluation. Audiological evaluation showed normal bilateral ABR thresholds in 59/63 children. Four children (6.3% of the total) had ABR threshold alterations but two showed normal threshold at ABR retest performed within 1 month of the first. The other two infants showed monolateral ABR alterations but one of these had a concomitant middle ear effusion. In conclusion, only one child (1.6% of the sample) had an altered ABR. This child had shown one positive SARS-CoV-2 swab in the absence of risk factors for hearing loss.

Conclusion: This study finds no evidence that maternal COVID19 infection is a risk factor in the development of congenital hearing loss in newborns.

2/6 (2022) - Bulging of the Oval Window in Common Cavity Deformity: A Possible Predictor of Meningitis.

Renzo Manara, Irene Avato, Andrea Uberti, Patrizia Trevisi , Roberto Bovo, Alessandro Martini, Davide Brotto, EU.COM Group: Stefano Berettini, Pietro Canzi, Andrea Ciorba, Eliana Cristofari, Domenico Cuda, Antonio Della Volpe, Giuseppe Nicolò Frau, Elisabetta Genovese, Pasquale Marsella, Alessandra Murri, Flavia Sorrentino, Vincenzo Vincenti, Diego Zanetti
Otol Neurotol. 2021 Oct 25. doi: 10.1097/MAO.0000000000003394. Online ahead of print

Abstract

Objective: To investigate the prevalence-rate of oval window bulging in the common cavity and its association with bacterial meningitis.

Patients: CT and clinical files of 29 children with preliminary diagnosis of common cavity deformity were collected from 13 Italian centers. **Intervention:** A retrospective case review study was conducted with a centralized evaluation of the temporal bone CT imaging was performed at Azienda Ospedale - Università Padova, Padova, Italy.

Main outcome measure: Diagnosis of common cavity was reviewed; in addition, a fluid protrusion into the middle-ear cavity through the oval window at CT imaging was considered as oval window bulging. Its association with the history of bacterial meningitis was investigated.

Results: Common cavity deformity was confirmed in 14/29 children (mean-age 11.4 ± 3.8 ; age- range 5-20; nine females) referred with this diagnosis. In 7/14 patients, the common cavity deformity was bilateral (i.e., 21 common cavities). Oval window bulging was found in 3/19 common cavities (concomitant middle-ear effusive otitis hampered the evaluation in two cases), while the internal acoustic meatus fundus was defective in 10/21 cases. History of bacterial meningitis was found in three children (21%) and two of them had oval window bulging at CT. In the case unrelated to oval window bulging, meningitis occurred late at the age of 12 during acute otitis contralateral to common cavity deformity (ipsilaterally to incomplete partition type 1).

Conclusion: Patients harboring common cavity deformity have a high risk of meningitis in their first years of life. Oval window bulging seems to be associated with a higher risk of meningitis. This information might be important for appropriate surgical planning.

3/6 (2022)- Cochlear Implant in Patients with Intralabyrinthine Schwannoma without Tumor Removal.

Andrea Laborai, Sara Ghiselli, Domenico Cuda.

Audiol Res. 2022 Jan 10;12(1):33-41. doi: 10.3390/audiolres12010004.PMID: 35076488

Abstract

(1) **Background:** Schwannomas of the vestibulocochlear nerve are benign, slow-growing tumors, arising from the Schwann cells. When they originate from neural elements within the vestibule or cochlea, they are defined as intralabyrinthine schwannomas (ILSs). Cochlear implant (CI) has been reported as a feasible solution for hearing restoration in these patients. (2) **Methods:** Two patients with single-sided deafness (SSD) due to sudden sensorineural hearing loss and ipsilateral tinnitus were the cases. MRI detected an ILS. CI was positioned using a standard round window approach without tumor removal. (3) **Results:** The hearing threshold was 35 dB in one case and 30 dB in the other 6 mo after activation. Speech audiometry with bisyllables in quiet was 21% and 27% at 65 dB, and the tinnitus was completely resolved or reduced. In the localization test, a 25.9° error azimuth was obtained with CI on, compared to 43.2° without CI. The data log reported a daily use of 11 h and 14 h. In order to not decrease the CI's performance, we decided not to perform tumor exeresis, but only CI surgery to restore functional binaural hearing. (4) **Conclusions:** These are the sixth and seventh cases in the literature of CI in patients with ILS without any tumor treatment and the first with SSD. Cochlear implant without tumor removal can be a feasible option for restoring binaural hearing without worsening the CI's performance.

4/6 (2022)- Listening comprehension in profoundly deaf children with cochlear implants: the role of auditory perception and foundational linguistic and cognitive skills.

Maria Nicastrì, Giovanni Ruoppolo, Letizia Guerzoni, Domenico Cuda, Giallini I, Cocchi C, Marco de Vincentiis, Greco A, Patrizia Mancini.

Eur Arch Otorhinolaryngol. 2022 Jan 13. doi: 10.1007/s00405-021-07156-y.

Abstract

Purpose: The aim of the study was to investigate the listening comprehension (LC) skills in deaf and hard of hearing children (DHH) using cochlear implants (CI). Besides, personal and audiological variables that could influence the levels of competence reached were analyzed.

Methods: Thirty-four children using CI were enrolled. LC skills were assessed through the standardized Italian test "Comprensione Orale-Test e Trattamento" (CO-TT). A univariate analysis was conducted to compare LC with gender, listening mode (unilateral or bilateral), maternal level of education and family income. A bivariate analysis was performed to search possible connections between children's performances and their individual characteristics, audiological conditions, and language levels. Finally, a multivariate analysis was performed using a stepwise hierarchical linear regression model which included all variables whose p value resulted ≤ 0.05 .

Results: Twenty-one children using CI (61.8%) showed adequate performances in terms of chronological age, while 13 (38.2%) showed difficulties in LC. Maternal level of education, age at diagnosis and non-verbal cognitive level accounted for 43% of the observed variance. Auditory attention skills explained an additional 15% of variance. Morphosyntactic comprehension added a further 12% of variance.

Conclusion: CI can really help many DHH children to reach adequate LC skills, but in some cases difficulties remain. Factors influencing LC need to be early investigated and considered when planning an appropriate rehabilitative intervention.

5/6 (2022)- An Adaptation and Validation Study of the Speech, Spatial, and Qualities of Hearing Scale (SSQ) in Italian Normal-Hearing Children.

Falzone C, Guerzoni L, Pizzol E, Fabrizi E, Cuda D

Audiol Res. 2022 May 29;12(3):297-306. doi:10.3390/audiolres12030031.

Abstract

This study aimed to translate and adapt the English version of the Speech, Spatial, and Qualities of Hearing Scale (SSQ) for children and for parents into the Italian language; validate SSQ for hearing children and their parents; and evaluate the discriminant validity of the instrument. A group of 102 normal-hearing Italian children, aged between 9 and 16 years, and their parents were included in this study. A group of 31 parents of normal-hearing Italian children aged between 6 and 8 years was also included. A group of 57 hearing-impaired Italian children aged between 9 and 16 years, and their parents were also included, as well as a group of 30 parents of hearing-impaired Italian children aged between 6 and 8 years. Cronbach's alpha in the SSQ for parents was 0.92; it was 0.95 in the SSQ for children. Guttman's split-half coefficient in SSQ for children for both λ_4 and λ_6 was 0.98; in SSQ for parents in λ_4 was 0.96 and λ_6 was 0.95. These data provide evidence for the discriminant validity of the SSQ scale (p-value < 0.001). Italian SSQ scales for children and for parents are now available.

6/6 (2022)- An innovative method for trans-impedance matrix interpretation in hearing pathologies discrimination.

Vozzi A, Ronca V, Malerba P, Ghiselli S, Murri A, Pizzol E, Babiloni F, Cuda D.

Med Eng Phys. 2022 Apr;102:103771. doi: 10.1016/j.medengphy.2022.103771.

Abstract

Trans-impedance measurement is a novel methodology for assessing the positioning of a cochlear implant (CI). This study proposes an innovative use of trans-impedance measurements to characterize specific hearing pathologies by means of the trans-impedance matrix (TIM) quantitative analysis. Three indices are used: Shannon Entropy, the Exponential Decay constant and Spatial Correlation. These indices were computed on the TIMs of two groups of patients, clustered in terms of hearing pathology: (i) congenital hearing loss (CONG) and (ii) otosclerosis (OTO). The study aimed to demonstrate the sensitivity of the above synthetic indices in relation to the considered hearing pathologies. Furthermore, the first two indices were employed to explore the influence of the positioning of the electrode, either over (i) the basal or (ii) the apical regions, on the TIMs patterns. The results suggest that the indices were statistically different for the patient groups and the positioning impacted solely on OTO patients. In particular: (i) CONG patients displayed significantly higher Shannon Entropy ($p = 0.0002$) and (ii) a lower Exponential Decay constant than OTO patients ($p = 0.001$); (iii) the OTO patients exhibited a lower Shannon Entropy and a higher Exponential Decay constant over the basal regions than the apical regions ($p < 0.008$); (iv) Spatial Correlation demonstrated that TIMs had specific patterns according to the hearing pathology ($p < 0.008$).

STUDI PUBBLICATI NELL'ANNO 2023

1/3 (2023)- Cavitating Lesions around the Cochlea Can Affect Audiometric Threshold and Clinical Practice.

Giulia Zambonini, Sara Ghiselli, Giuseppe Di Trapani, Daria Salsi, Domenico Cuda
Audiol Res. 2023 Oct 20;13(5):821-832. doi: 10.3390/audiolres13050072.

Abstract

There are several pathologies that can change the anatomy of the otic capsule and that can distort the bone density of the bony structures of the inner ear, but otosclerosis is one of the most frequent. Similar behavior has been shown in patients affected by osteogenesis imperfecta (OI), a genetic disorder due to a mutation in the genes coding for type I (pro) collagen. In particular, we note that otosclerosis and OI can lead to bone resorption creating pericochlear cavitations in contact with the internal auditory canal (IAC). In this regard, we have collected five cases presenting this characteristic; their audiological data and clinical history were analyzed. This feature can be defined as a potential cause of a third-window effect, because it causes an energy loss during the transmission of sound waves from the oval window (OW) away from the basilar membrane.

2/3 (2023)- Current trends on subtotal petrosectomy with cochlear implantation in recalcitrant chronic middle ear disorders.

Canzi P, Berrettini S, Albera A, Barbara M, Bruschini L, Canale A, Carlotto E, Covelli E, Cuda D, Dispenza F, Falcioni M, Forli F, Franchella S, Gaini L, Gallina S, Laborai A, Lapenna R, Lazzerini F, Malpede S, Mandalà M, Minervini D, Pasanisi E, Ricci G, Viberti F, Zanetti D, Zanoletti E, Benazzo M.
Acta Otorhinolaryngol Ital. 2023 Apr;43(Suppl. 1):S67-S75. doi: 10.14639/0392-100X-suppl.1-43-2023-09.

Abstract

Objective: To establish the safety and effectiveness of subtotal petrosectomy with cochlear implantation in patients affected by chronic middle ear disorders to refractory to previous surgical treatments.

Methods: A multicentre, retrospective study was conducted on patients affected by recalcitrant chronic middle ear disorders who underwent cochlear implantation in combination with subtotal petrosectomy. Patients' details were collected from databases of 11 Italian tertiary referral centres. Additionally, a review of the most updated literature was carried out.

Results: 55 patients were included with a mean follow-up time of 44 months. Cholesteatoma was the most common middle ear recurrent pathology and 50.9% of patients had an open cavity. 80% of patients underwent a single stage surgery. One case of explantation for device failure was reported among the 7 patients with post-operative complications.

Conclusions: Subtotal petrosectomy with cochlear implantation is a benchmark for management of patients with recalcitrant chronic middle ear disorders. A single stage procedure is the most recommended strategy. Optimal follow-up is still debated. Further studies are required to investigate the role of this surgery in paediatric patients.

3/3 (2023)- The influence of auditory selective attention on linguistic outcomes in deaf and hard of hearing children with cochlear implants.

Nicastri M, Giallini I, Inguscio BMS, Turchetta R, Guerzoni L, Cuda D, Portanova G, Ruoppolo G, Dincer D'Alessandro H, Mancini P.

Eur Arch Otorhinolaryngol. 2023 Jan;280(1):115-124. doi: 10.1007/s00405-022-07463-y. Epub 2022 Jul 13.

Abstract

Purpose: Auditory selective attention (ASA) is crucial to focus on significant auditory stimuli without being distracted by irrelevant auditory signals and plays an important role in language development. The present study aimed to investigate the unique contribution of ASA to the linguistic levels achieved by a group of cochlear implanted (CI) children.

Methods: Thirty-four CI children with a median age of 10.05 years were tested using both the "Batteria per la Valutazione dell'Attenzione Uditiva e della Memoria di Lavoro Fonologica nell'età evolutiva-VAUM-ELF" to assess their ASA skills, and two Italian standardized tests to measure lexical and morphosyntactic skills. A regression analysis, including demographic and audiological variables, was conducted to assess the unique contribution of ASA to language skills.

Results: The percentages of CI children with adequate ASA performances ranged from 50 to 29.4%. Bilateral CI children performed better than their monolateral peers. ASA skills contributed significantly to linguistic skills, accounting alone for the 25% of the observed variance.

Conclusions: The present findings are clinically relevant as they highlight the importance to assess ASA skills as early as possible, reflecting their important role in language development. Using simple clinical tools, ASA skills could be studied at early developmental stages. This may provide additional information to outcomes from traditional auditory tests and may allow us to implement specific training programs that could positively contribute to the development of neural mechanisms of ASA and, consequently, induce improvements in language skills.

