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التوثيق الالكتروني والميكروفيلم

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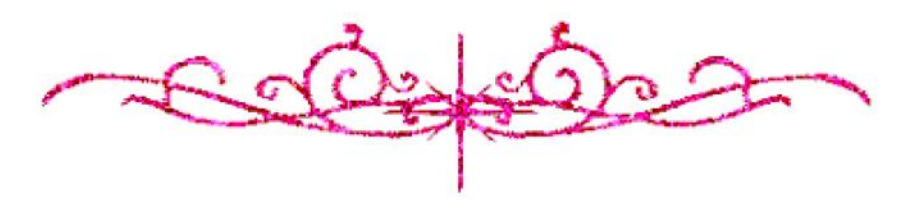

Role of Computed Tomography and Magnetic Resonance Imaging in detecting the Prevalence of inner ear anomalies among cochlear implant candidates

Thesis

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2020

First, I thank **God** *for blessing me more than I deserve and for his uncountable gifts which are exceedingly abundantly above all what we ask or think.*

I would like to express my deepest appreciation and gratitude to **Assistant Prof. Dr. Tougan Taha Abd El Aziz** *for her sincere encouragement, constant advice and valuable guidance throughout the performance of this work.*

I owe special thanks, gratitude and appreciation to **Lecturer Dr. Ahmed Samy Abdelrahman** *with his close supervision, continuous advice, patience and support which gave me the best guidance during different stages of this work.*

Finally, I can not forget to thank my dear husband, my lovely daughter, my family and my colleagues for their support and encouragement.

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List of Abbreviations

Abb.	Full Term
ABI	Auditory brainstem implantations
ALARA	As low as reasonably achievable
CI	Cochlear implants
CPA	Cerebellopontine angle
CT	Computed tomography
CVN	Cochleovestibular nerve
DRIVE	Driven equilibrium
ELD	Endolymphatic duct
FRFSE	Fast recovery fast spin-echo
HRCT	High resolution computed tomography
IAC	Internal auditory canal
IP-I	Incomplete partition type i
IP-II	Incomplete partition type ii
IPIII	Incomplete partition type iii
IV	Intravenous
LSCC	Lateral semicircular canal
LVA	Large vestibular aqueduct
MRI	Magnetic resonance imaging
PACS	Picture archiving and communications system
PSCC	Posterior semicircular canal
SCC	Semicircular canal
SD	Standard deviation
SNHL	Sensorineural hearing loss
SSCC	Superior semicircular canal

ABSTRACT

Background: Hearing loss management using cochlear implants in patients with inner ear anomalies has long been discussed in the otology community. Magnetic resonances imaging (MRI) and Computed tomography (CT) play important roles in the preoperative assessment of inner ear abnormalities such as cochlear nerve deficiency and variant anatomy as these abnormalities may not only affect the decision of the implantation procedure or the patient's prognosis regarding auditory improvement, but also the risk of complications.

Objective: To examine the prevalence of inner ear anomalies among cochlear implant recipients in patients with congenital sensorineural hearing loss among the pediatric age group in the Demerdash hospital, Ain Shams university using High resolution computed tomography (HRCT) and MRI imaging.

Methods: A retrospective descriptive study over the course of 9 months that included all patients that are candidates for cochlear implant referred to the Radiology department, Ain Shams University Hospitals for a preoperative imaging in the form of CT and MRI scans.

Results: CT and MRI scans of 33 patients who had congenital hearing loss and were candidates for cochlear implantation with total 66 ears were reviewed. Inner ear anomalies were identified in 8 patients representing a prevalence (24.2%) with 14 ear diseased. Anomalies were seen bilaterally in 6 patients and unilaterally in 2 patients. Among the 14 diseased ear, 9 ears (64.3%) were seen with incomplete partition II, 7 ears (50%) were seen with enlarged vestibular aqueduct, 4 ears (28.6%) were seen with cochlear hypoplasia, 3 ears (21.4%) were seen with semicircular canal aplasia, 2 ears (14.3%) were seen with incomplete partition type I , 2 ears (14.3%) were seen with cochlear nerve aplasia , 2 ears with cochlear aplasia (14.3%) , 1 ear (7.1%) was seen with common cavity ,1 ear (7.1%) with complete labyrinthine aplasia.

Conclusion: Prevalence of inner ear anomalies among cochlear implant candidates was 24.2%. This result is consistent with results worldwide and the most common anomalies were Incomplete partition II and large vestibular aqueduct.

Keywords: Sensorineural hearing loss, cochlear implant, high-resolution computed tomography, magnetic resonance imaging, inner ear.

Abbreviations: Computed tomography (CT), Magnetic resonance imaging (MRI), High resolution computed tomography (HRCT), Internal auditory canal (IAC), Cerebellopontine angle (CPA).