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AUDITORY IMPLANTS FOR ADULTS

Cochlear implantation in adults

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Abstract

Introduction: Congenital deafness in children is the gold standard for cochlear implant indications. As a revolutionary development in the treatment of deafness, cochlear implantation has seen its indications broaden over the years. Currently, an increasing number of adults have deafness eligible for implantation, yet it remains under-prescribed in Tunisia and still globally.

Objectives: To determine the epidemiological and clinical profile of a series of adults who have undergone cochlear implantation, discuss the therapeutic outcomes, and present the current indications for cochlear implantation in adults.

Patients and Methods: A retrospective descriptive study of 20 adults who received a cochlear implant.

Results: The study group included 9 men and 11 women (sex ratio = 0.8). The average age was 34 years [range 18 to 68 years]. Five patients had a family history of congenital deafness, and one patient had a history of familial otosclerosis. Two patients had Usher's syndrome, one of whom was blind. Hypoacusis affecting intelligibility was present in all cases, tinnitus in 5 patients, speech disorders in 5 patients, and vertiginous symptoms in 2 patients. A complete audiometric and speech therapy assessment was performed for all patients. An intelligibility threshold above 60 dB with hearing aid was found in all patients. Only two patients had residual hearing at low frequencies. A CT scan and MRI were performed for all patients. Imaging found an inner ear malformation in two patients, otosclerosis in one patient, a trans-labyrinthine fracture in two patients, and signs of chronic otitis in four patients. All patients were operated on one side only, and no hybrid implants were used. Three cases of postoperative complications were noted, all transient. The results varied, with the most determining factor being the duration of auditory deprivation before implantation.

Conclusion: With the current technological advancements in cochlear implantation, the low morbidity, and the considerable improvement in quality of life, it becomes logical to facilitate access to this rehabilitation procedure.

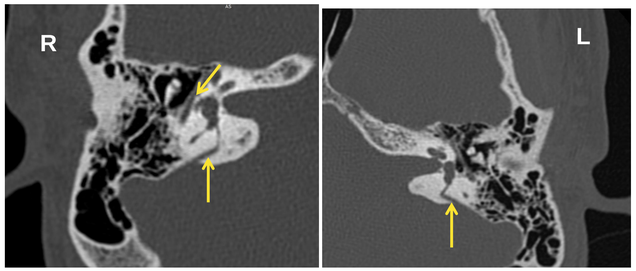

Figure 2 : Axial CT scan showing bilateral translabyrinthine fracture (yellow arrow)

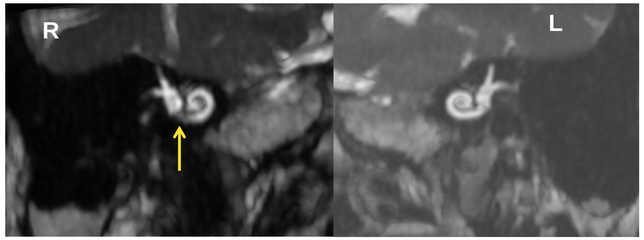

Figure 2 : Oblique sagittal MRI in T2WI sequence with MIP reconstruction : Extinction of the T2 hyperintensity of the basal turn of the cochlea and the lateral semicircular canal on the right ear (yellow arrow)

Objectifs

To determine the epidemiological and clinical profile of a series of adults who have undergone cochlear implantation, discuss the therapeutic outcomes, and present the current indications for cochlear implantation in adults.

Méthodes et Matériels

A retrospective descriptive study of **20 adults** who received a cochlear implant.

Résultats

- 9 men and 11 women (sex ratio = 0.8).
- Average age = 34 years [18 - 68 years].

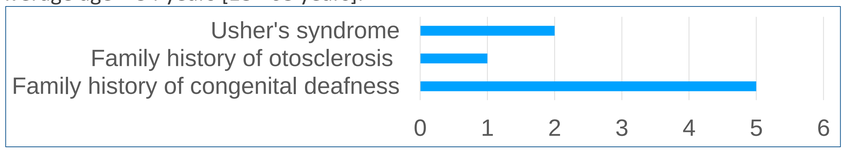

Figure 1 : Patients' medical history

- **Symptoms:** Hypoacusis affecting intelligibility (all cases) / tinnitus (5 patients)/ speech disorders (5 patients) /vertigo (2 patients)
- Complete audiometric and speech therapy assessment performed for all patients.
- **Intelligibility threshold above 60 dB** with hearing aid found in all patients. Only two patients had residual hearing at low frequencies.
- **CT scan and MRI** performed for all patients **(Table 1).**
- All patients operated on one side only (no hybrid implants were used).
- **Postoperative complications :** 3 patients, all transient.
- **Resulats** varied **(Figure4)**, with the most determining factor being the duration of auditory deprivation before implantation.

Table 1 : CT scan and MRI pathological findings

Imaging findings	N
Inner ear malformation	2
Otosclerosis	1
Trans-labyrinthine fracture **(Figure 2 and 3)**	2
Signs of chronic otitis	4

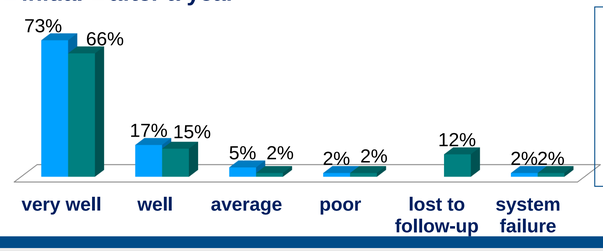

Figure 4 : Functional outcoes for unilateral adult cochlear implantaion

Conclusion

With the current technological advancements in cochlear implantation, the low morbidity, and the considerable improvement in quality of life, it becomes logical to enlarge indications for cochlear implantations for adults (1) and to facilitate access to this rehabilitation procedure. Functional outcomes (2) depend on: Profound deafness occurring after the development of language/ The most recent onset of deafness possible/ Continuous use of hearing aids/ Presence of some residual hearing/ Good lip-reading abilities/ Good cognitive abilities, attention, memory, and adaptability/ Absence of depressive syndrome or psychiatric pathology/ Full insertion of the electrode array into the tympanic ramp.

Références

(1) Carlson, M. L. (2020). Cochlear implantation in adults. New England Journal of Medicine, 382(16), 1531-1542.
(2) Hermann, R., Lescanne, E., Loundon, N., Barone, P., Belmin, J., Blanchet, C., ... & Truy, E. (2019). French Society of ENT (SFORL) guidelines. Indications for cochlear implantation in adults. European annals of otorhinolaryngology, head and neck diseases, 136(3), 193-197.

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