

Functional outcome and complications after cochlear implantation in India



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Objective

Retrospective assesment of:

- Functional outcome
- Complications

Setting: Madras ENT Research Foundation

- Private hospital
- ~ 100 CI's annually
- 1 year rehabilitation program after CI (1 hour x 2 weekly)



Study population

Operated: 1st of June 2005 - 1st of June 2009:	192 patients
Under the age of 18 at time of surgery:	172 patients (100%)
Completed 1-year rehabilitation program:	115 patients (64%)
Discontinued rehabilitation:	64 patients (36%)

Study population characteristics

	Median, mo	Range (min-max), mo
Age at onset of deafness, mo	0	0-144
Duration of deafness, mo	43	4-199
Age at diagnosis, mo	13.5	1-156
Age at implantation, mo	47	9-199
	N (% of total group)	
Male	62 (53.9)	
Female	53 (46.1)	
Prelingual	107 (93.0)	
Postlingual	8 (7)	
Bilateral implantation	3 (2.6)	
Unilateral implantation	112 (97.4)	
Syndromic deafness	9 (7.8)	
Inner ear abnormality	21 (18.3)	
Additional disability	28 (24.3)	
Additional disease	6 (5.2)	
Hearing aid use before implantation	83 (72.2)	

Cause of deafness

Etiology	N (% of total group)
Congenital	99 (86.1)
- Consanguinity	- 19 (16.5)
- Pendred syndrome	- 1 (0.9)
- Usher syndrome	- 1 (0.9)
- Congenital Rubella syndrome	- 3 (2.6)
- Waardenberg syndrome	- 1 (0.9)
- Branchio-oto-renal syndrome	- 1 (0.9)
- Goldenhar syndrome	- 1 (0.9)
- Chudley McCullough syndrome	- 1 (0.9)
- Premature	- 3 (2.6)
- Unspecified maternal fever during pregnancy	- 2 (1.7)
Meningitis	7 (6.1)
Mumps	1 (0.9)
Thypoid fever	1 (0.9)
Unknown	7 (6.1)

Functional outcome

- Categories of auditory performance (CAP)
- Speech Intelligibility Rating (SIR)
- Meaningful auditory integration scale (MAIS)
- Meaningful use of speech scale (MUSS)

Registered every 1 (CAP, SIR) and 3 (MAIS, MUSS) months the by rehabilitation therapist

Results

- CAP 5-7: 106 (92%) patients
- SIR 3-5: 90 (79%) patients
- MAIS 30-40: 59 (51%) patients
- MUSS 30-40: 20 (17%) patients

Figure 1 CAP scores after 12 months (median, range)

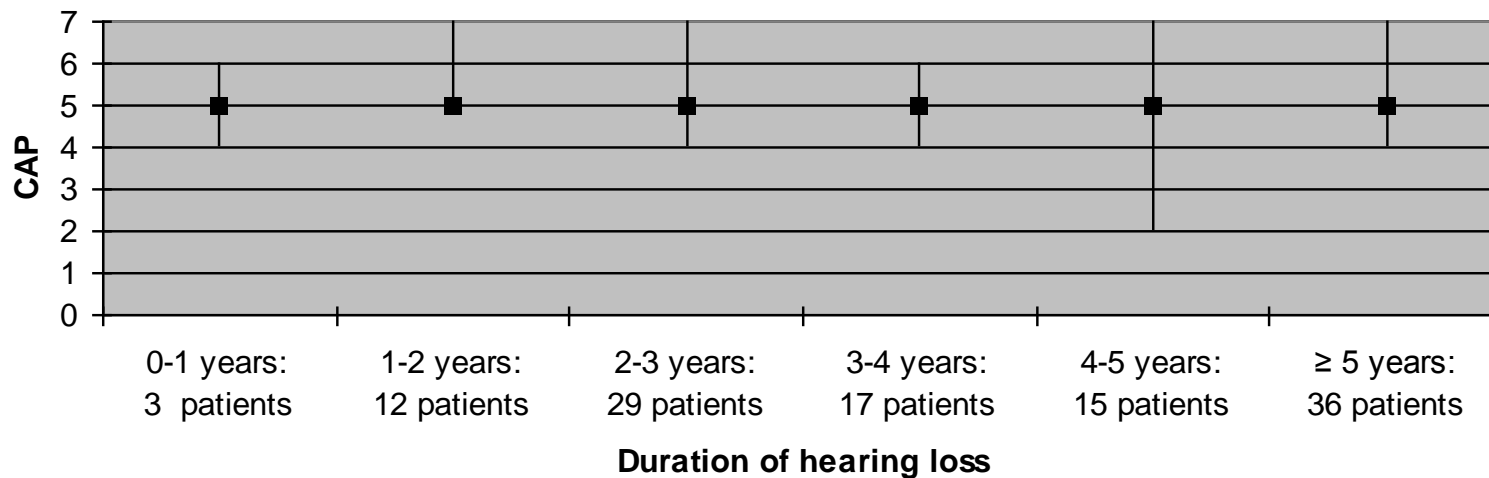


Figure 2 SIR scores after 12 months (median, range)

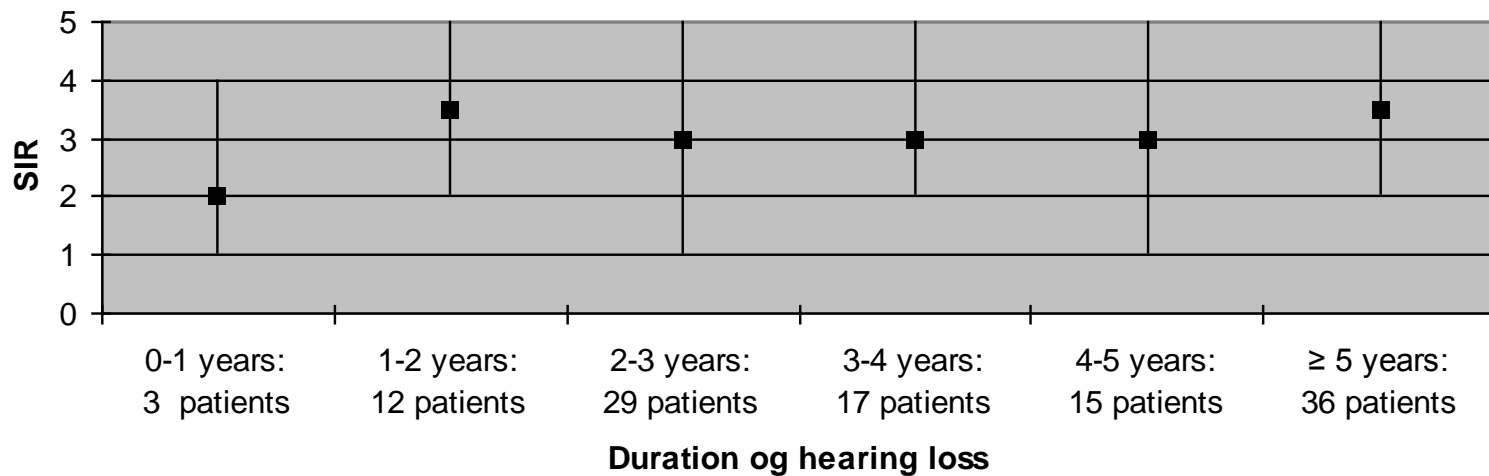


Figure 3 MAIS scores after 12 months (median, range)

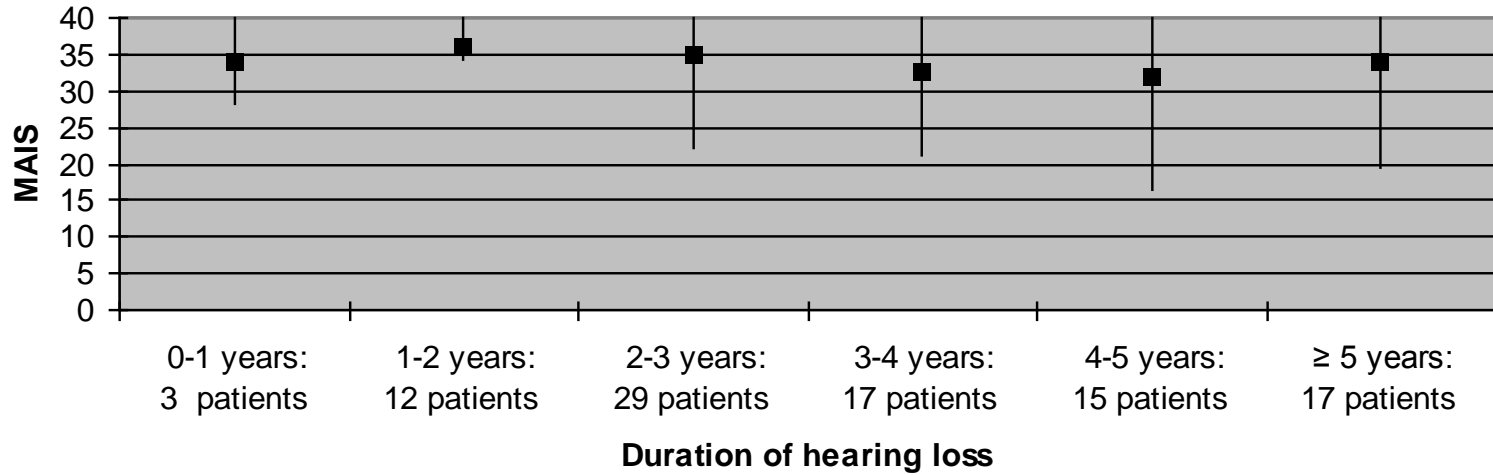
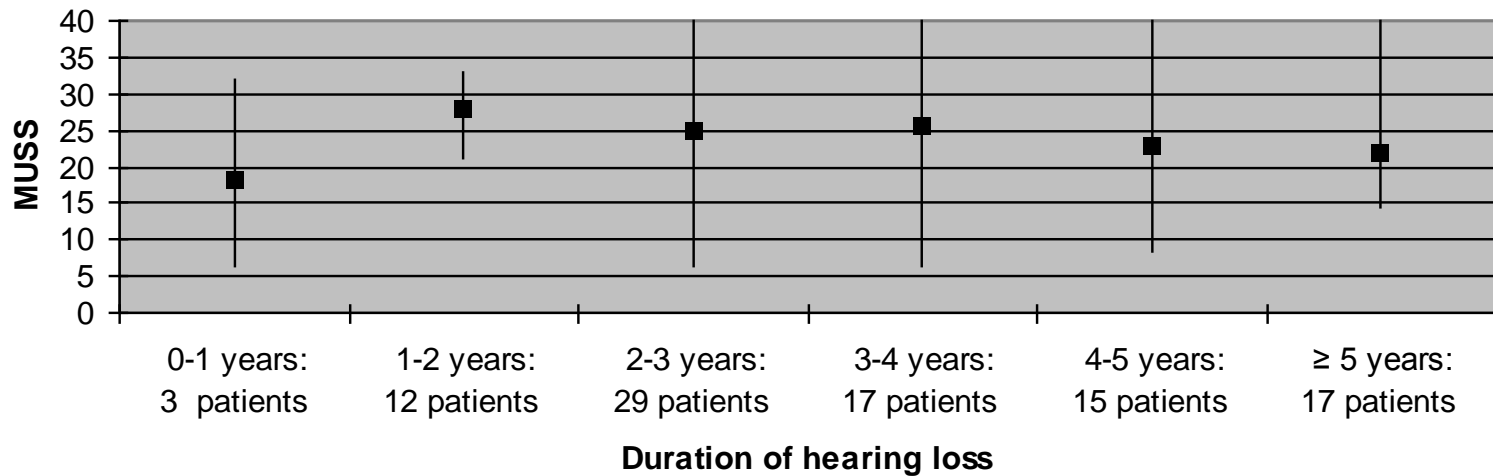


Figure 4 MUSS scores after 12 months (median, range)



Complications 1 year post-op

Complications	
	N (% of total group)
Minor complications¹	5 (4.3)
- Facial nerve twitching on stimulation	- 2 (1.7)
- Temporary facial paresis	- 1 (0.9)
- Wound seroma	- 2 (1.7)
Major complications²	5 (4.3)
- Wound infection	- 2 (1.7)
- Wound infection due to trauma	- 1 (0.9)
- Device failure due to trauma	- 1 (0.9)
- Electrode extrusion due to chronic suppurative otitis media	- 1 (0.9)
Total	10 (8.6)

¹Includes complications that resolved spontaneously or was treated conservatively.

²Includes complications that required a surgical intervention.

Functional outcome: India vs. Denmark

	India 115 patients	Denmark 74 patients (L.Percy-Smith, 2006)
CAP 5-7	92%	76%
SIR 3-5	79%	50%

Why the difference?

- Implant-age: 6-24 mo in Danish study, 12 mo in the present study
- India: Outcome scores awarded by the same therapist responsible for rehabilitation
- Culture: Joint families
- Private vs. public healthsystem
- Drop out group: 64 (36%) of 179 patients
 - Long distances
 - Lack of progress? → Selection bias

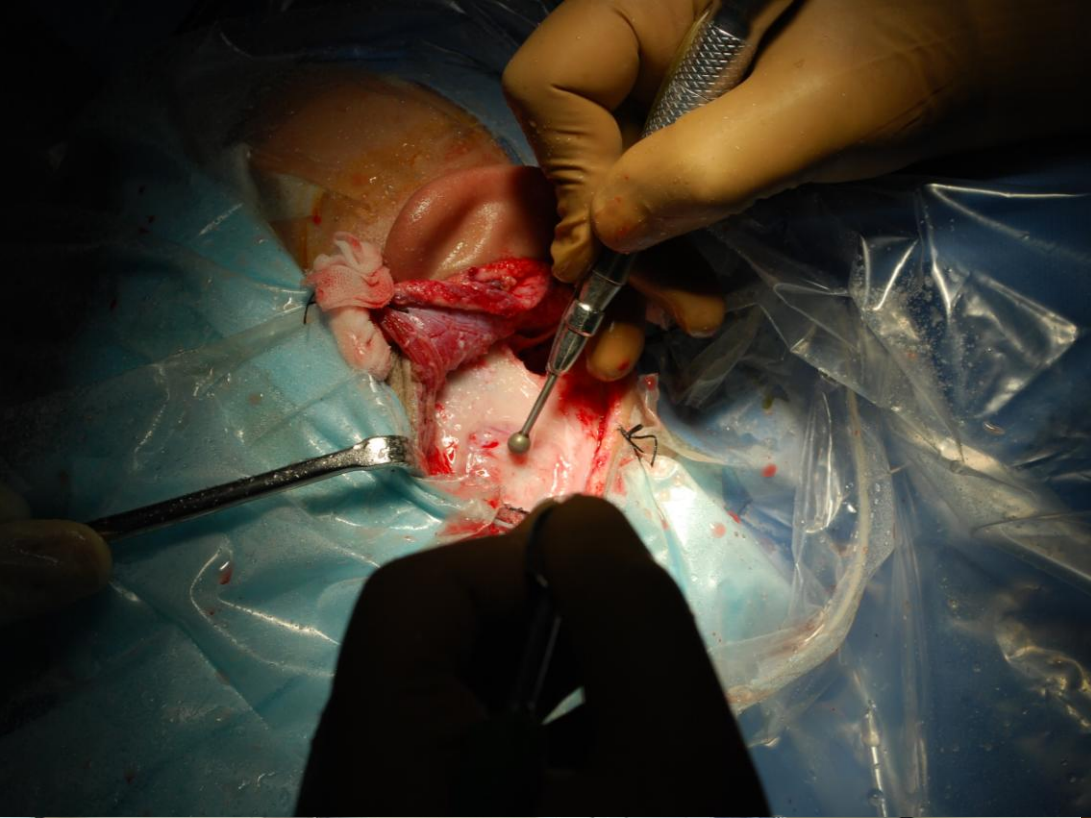


Table 4 Categories of auditory performance

Category	Criteria
7	Use of telephone, known speaker
6	Understanding conversation, no lip-reading
5	Understanding common phrases, no lip-reading
4	Discrimination of speech sounds
3	Identification of environmental sounds
2	Response to speech sounds (eg. go)
1	Awareness of environmental sounds
0	No awareness of environmental sounds

Table 5 Speech intelligibility rating

Category	Criteria
5	Connected speech is intelligible to all listener's; the child is understood easily in everyday contexts
4	Connected speech is intelligible to a listener who has little experience of a deaf person's speech; the listener does not need to concentrate unduly
3	Connected speech is intelligible to a listener who concentrates and lip-reads within a known context
2	Connected speech is unintelligible; intelligible speech is developing in single words when context and lip reading cues are available
1	Prerecognizable words in spoken language (the child's primary mode of everyday communication may be manual)