

BILATERAL COCHLEAR IMPLANTATION

W.Baumgartner, J.Hamzavi, C.Vasak, B.Schenk, S.M.Pok

ENT University Department Vienna, Austria
Währinger Gürtel 18-20 A-1097 Wien

wolf-dieter.baumgartner@akh-wien.ac.at
www.univie.ac.at/cochlear

SUMMARY

Since 1995 22 deaf patients (8 adults, 14 children) underwent bilateral cochlear implantation in a two step surgery. In the adult group we could identify, that bilateral implantation only in selected cases is useful. After two years experience in bilateral adult cochlear implantation, we started in children in 1998. So far all bilaterally implanted school children attend mainstream primary school.

STATE OF THE ART

In the last decades around 35.000 patients (out of them around 15.000 children) were cochlear implanted world wide. Cochlear implantation became a routine procedure in the treatment of postlingual deafness in adults and deafness (in all etiologies) in children. Cochlear implantation still is no indication in prelingually deafend adults, or adults integrated in the deaf community by using sign language. Generally only one ear will be implanted . For decades bilateral hearing aid support for hearing impaired patients (especially in children !) is out of discussion. The importance of bilateral hearing for the development in children is quite clear, but bilateral cochlear implantation is still rare. The new approach of this study, out of the experience of more than 340 cochlear implantations at the ENT university department Vienna, is the bilateral cochlear implantation. Right now there are only very view ENT centers woldwide, performing bilateral implantation (for example ENT University department Würzburg, Germany- and the Vienna ENT University department, Austria). Right now bilateral cochlear implantation happened only incidentially. For example up to date, there are only 12 bilateral CI recipients in the US and none in Japan. Aim of this study and sharing this experience with international colluegues, is to define bilateral implantation as a new state of the art in future, when indicated in a patient.

MATERIAL AND METHODS

Since 1995 eight adults underwent bilateral cochlear implantation in a two step surgery. Six patients are wearing bilaterally implants from the Combi 40 - Combi 40 + series (Med El, Innsbruck, Austria) or older analog implants (Med El, Innsbruck, Austria), one patient wears two implants from different manufacturers- Nucleus mini 22 (Cochlear corp., Melbourne, Australia) / Combi 40+ (Med El) and one patient wears Nucleus mini 22 / Nucleus contour (Cochlear corp., Melbourne, Australia). Analysing the patients data , ethiology, surgical situs and implant type it is useful to form four different groups.

Group A: older analog device versus Med El Combi 40 / Combi 40+

Group B: Nucleus mini 22 versus Med El Combi 40+

Group C: same implanttype on both ears, but different fitting (= programming) parameter, because of etiology or surgical circumstances

Group D: same cochlear implant bilaterally (for example two Med El, or two Nucleus) and symetric fitting parameter

After two years experience in adults we started bilateral implantation 1997 in children. So far 14 children underwent cochlear implantation in a two step surgery. Prior to bilateral implantation all children were good unilateral cochlear implant performers. The decision in favour of bilateral implantation was done after careful audiological reevaluation, together with parents and children. If necessary, the radiological evaluation through CT and MRI scans was repeated, for example in case of meningitis. The timeperiod in between the first unilateral and the following contralateral (bilateral) cochlear implantation, was within two months, up to seven years (mean 20 months). The childrens age at the time of bilateral implantation was between 24 months and 14 years old (mean 80 months).

RESULTS

As a result, significant superior speech understanding- especially in noise, and acoustic orientation, can be achieved through bilateral cochlear implantation, in a “group D situation” only !

To obtain a subjective and in speech understanding performance evident benefit of a bilateral cochlear implantation, two multichannel fast stimulators, are mandatory. Otherwise the “better” ear remains dominant. For the intended and proved benefit of bilateral implantation we recommend bilateral cochlear implantation in a “group D” situation only.

We could not observe any surgical or psychological problem. All “group D” children and adults (out of them seven school children), wear both implants with a behind the ear speech processor (Med El Tempo+®, Nucleus esprit®) all over the day. Seven school aged children (=100%) attend regular mainstream school successfully. Children, parents and teacher report improved life quality, which is correlated to enhanced speech understanding and directional hearing. According to this data and the cumulative bilateral cochlear implant experience in children and adults of over 36 years, bilateral cochlear implantation should be golden standard in all meningitis cases and should be at least considered- especially in children, whenever audiologically, anatomically and financially possible.

REFERENCES

1. W.Baumgartner, W.Gstöttner, J.Hamzavi, P.Franz
RESULTATE BILATERALER COCHLEAIMPLANTATIONEN
Acta Oto-Rhino-Laryngologica Nova, 1999: 9/1-2; 25
2. J.Helms, C. Ilberg, W.Gstöttner, J.Müller, J.Kiefer, W.Baumgartner, M.Zwicknagel,
C.Zierhofer, B.Stöbich
COMPARISON OF THE MED EL BTE PROCESSOR TEMPO+ AND THE BODY
WORN PROCESSOR CISPRO+
Proceedings of the 6th International Cochlear Implant Conference Miami 2000; 139/18
3. Baumgartner W.D., Gstöttner W., Hamzavi J., Franz P.
RESULTS OF BILATERAL COCHLEAR IMPLANTATION
Abstractbook 3rd International Symposium on Electronic Implants in Otology &
Conventional Hearing Aids, Birmingham 2000: 31-32
4. W.Baumgartner, J.Hamzavi, B.Egelierler, W.Gstöttner
RESULTS OF BILATERAL COCHLEAR IMPLANTATION IN 10 CHILDREN
Abstract book of 5th European Symposium of Paediatric Cochlear Implantation,
Antwerpen 2000: 100
5. Baumgartner W.D., J.Hamzavi, P.Franz, W.Gstöttner
MODERNE OHRIMPLANTOLOGIE
Acta Oto-Rhino-Laryngologica Nova, 2000: 10/2; 56
6. K.Strohmayr, W.D.Baumgartner
COCHLEAR IMPLANTKINDER IM REGELSCHULSYSTEM EIN
SCHULVERSUCH
Acta Oto-Rhino-Laryngologica Nova, 2000: 10/2; 59
7. W.Baumgartner, J.S.Hamzavi, B.Egelierler, C.Vasak, W.Gstöttner
RESULTS OF BILATERAL COCHLEAR IMPLANTATION IN CHILDREN
Abstractbook 8th Symposium "Cochlear Implants in Children"
House Ear Institute 2001: 47
8. Baumgartner W., Hamzavi J., Vasak C., Schenk B., Jappel A.
RESULTS OF BILATERAL COCHLEAR IMPLANTATION IN 13 CHILDREN
Abstractbook 3rd Asia Pacific Symposium on Cochlear Implant and related Sciences
2001: 54
9. W.Baumgartner, J.Hamzavi, C.Vasak, P.Franz
BILATERALE COCHLEA IMPLANTATION BEI KINDERN
HNO Informationen 2/2001: 58
10. Baumgartner WD, Hamzavi JS, Vasak C, Schenk B, Pok SM
RESULTS OF BILATERAL COCHLEAR IMPLANTATION IN 14 CHILDREN
Abstractbook ESPORL-Conference 2001: 14

ACKNOWLEDGEMENT

The authors thank Mrs.cand.med. Alexandra Jappel , collecting all the patients data.