

COCHLEAR IMPLANTS COMPLICATIONS IN ALEXANDRIA UNIVERSITY HOSPITAL

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ABSTRACT

Our objective is to determine the complication rate in children from a Alexandria University Hospital Cochlear Implant program and to discuss their causes and treatments. The methods include a retrospective study of 175 consecutive patients in otorhinolaryngology department of the Alexandria University Hospital. All patients receiving cochlear implants, from 1 January 2003 to 31 July 2014, have been included. All complications and treatments including that which related to plastic surgery were systematically reviewed with an average duration of follow-up to 6 months. The results reveal that the overall rate of complications in our group was 15.4% (27 of 175). Wound infections represent the most common complication occurred. There were no cases of postsurgical meningitis. Two patients (1.1%) underwent exploration followed by reimplantation. In conclusion, we find that Cochlear Implantation is a safe low-morbidity technique with a relatively low complication rate in the presented population.

KEYWORDS: Cochlear Implants, Complications, Postoperative Care, Children.

INTRODUCTION

Cochlear Implantation (CI) has been established worldwide as a safe and effective method for rehabilitation of profoundly hearing impaired children, who derives insufficient benefit from amplification.

Cochlear Implantation is a relatively safe surgical procedure⁽¹⁻⁵⁾. However, complications can occur associated with the surgical approach or the postoperative care. Since the number of cochlear implantations has increased considerably during the last decade, it is important that both patients and practitioners be aware of the potential complications. Some data are already available concerning surgical and medical complications⁽¹⁻⁵⁾.

Definition of complications: According to the literature, major complications were considered those that were life threatening, hospitalization or those that required surgery (including exploration), whereas minor complications were those that could be treated medically.

Major complications have been defined by Bathia⁽⁶⁾ and Venail⁽⁵⁾ as: death, meningitis, surgery without reimplantation due to large scalp necrosis, severe infection, electrode shifting, eardrum perforation, receiver repositioning and cholesteatoma.

Minor complications have been defined as transient facial palsy, scalp hematoma, infections that treated without surgery and facial stimulation^(5,6).

On the base of their onset, cochlear implant complications have been defined as early postoperative (when occurred up to 3 months postoperatively) and late postoperative (more than 3 months postoperative, including device failure and cholesteatomas)⁽⁵⁾.

Aim and objectives of study:

1- Identify epidemiological features of the complications that have been occurred.

2- This study was carried on 175 cochlear implantations in children, aiming to give data on cochlear implant surgery.

3- Evaluate the outcome of our management.

METHODS

A retrospective study of cochlear implants was performed from January 2003 to July 2014. All the operations were undertaken by the same surgical team, at otorhinolaryngology department of the Alexandria University Hospital. A systematic database search has been performed. All the case notes were examined for further details if a complication had occurred.

The complications in this study were collected regardless are due to surgical intervention or during post-operative care.

All the patients were properly selected for the unilateral cochlear implant, the surgical procedure was extended post-auricular incision through facial recess approach with facial nerve monitoring, all the patients receive prophylactic antibiotics (3rd generation cephalosporine) and all the devices used were Nuclis cochlea.

The selection criteria of complications as major and minor.

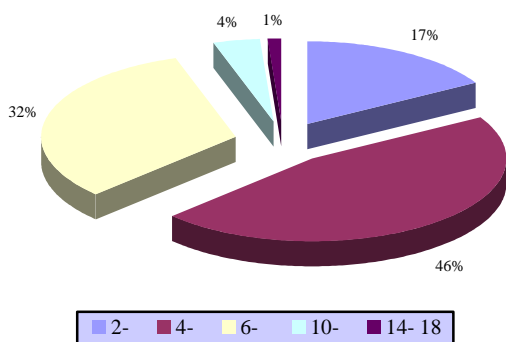
Patients were called for follow-up visits during the first week, second weeks, fourth weeks and sixth weeks after implantation.

Statistical analysis:

The data were collected and entered into SPSS system files (SPSS package version 18) using personal computer the data collected have been analyzed using Descriptive statistics.

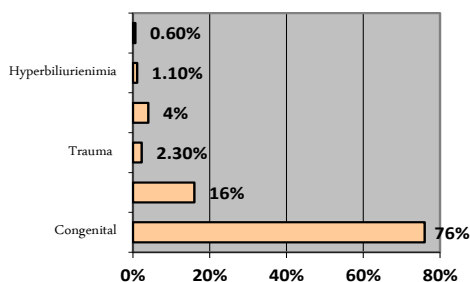
RESULTS

This study included 175 cases 86 were males (49.1 %) and 89 were females (50.9 %). The mean age of the patients were 5.7 ± 2.2 years with a range of 2.5 to 18 years (figure 1).



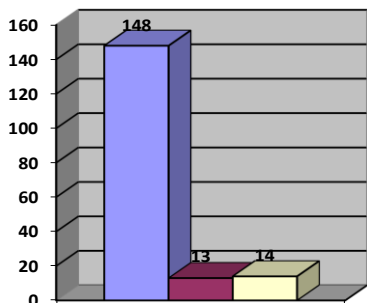
(Figure 1) showing the age in studied patients

The commonest causes of cochlea affection are congenital was found in 133 patients (76%) followed by meningitis in 28 patients (16%), Trauma in 4 patients (2.3%), perinatal hypoxia in 7 patients (4%), hyperbiliurienimia in 2 patients (1.1%) and maternal infection in 1 patient (0.6%) (figure 2).



(Figure 2) showing the causes of cochlear affection in studied patients

The major and minor complications were detected during the follow-up period (figure 3).

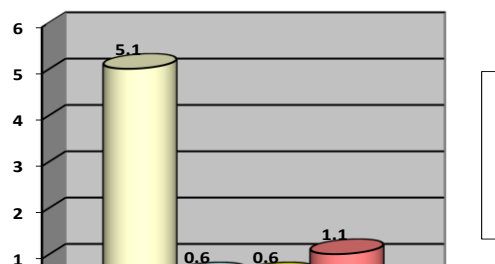


(Figure 3) Distribution of complications in studied patients

We found that the overall rate of complication was 15.4% (27 of 175) in the total population. 7.4% (13

of 175) occurred in minor postoperative, and 8% (14 of 175) in major postoperative complications.

Minor postoperative complications: most frequent complications (figure 4) were found Wound infection in nine patients (5.1%). Seroma collection in one patient (0.6%). Suture dehiscence in one patient (0.6%), were normally treated conservatively and not loss of implant. We had two cases of transient facial nerve paralysis (1.1%).

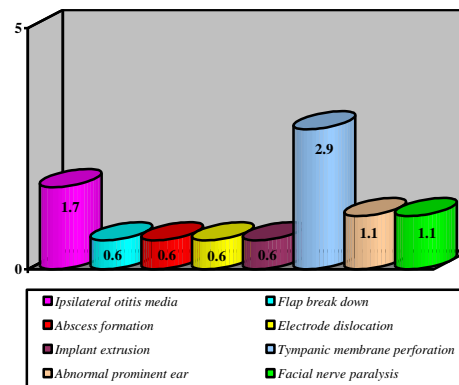


(Figure 4) Distribution of minor postoperative complications

Major postoperative complications: among the major postoperative complications (figure 5), were found three cases ipsilateral sever acute otitis media (1.7%), that required hospitalization but healed after parenteral antibiotic therapy. Flap break down in one patient (0.6%) were treated conservative and local wound care.

We had one case of abscess formation (0.6%) which required incision and drainage of abscess, followed with conservative treatment.

Two cases of reimplantation are present in our database. One due to electrode dislocation (0.6%) and other case due to implant extrusion (0.6%). We also had five cases of tympanic membrane perforation (2.9%) treated with tympanoplasty (type I), two cases of abnormal prominent ear (1.1%) and two cases of permanent facial nerve paralysis (1.1%). We did not register any cases of meningitis.



(Figure 5) distribution of major postoperative complications

DISCUSSION

Cochlear Implantation is an established method of auditory rehabilitation for the severe and the profound hearing impairment.

CI is now a worldwide surgical procedure performed routinely in numerous centers. Expanding criteria for cochlear implantation is leading to a significant increase in the number of patients using such devices. The surgical procedure for implantation has undergone modifications over the past years, with changes directed at preventing surgical and medical complications⁽⁵⁻⁷⁾.

Thus, although the incidence of complication in a cochlear implant program is small, it is necessary to be aware of them, so that they can be immediately identified and treated.

The average incidence of CIs complication ranges from 8 to 18% and our data (overall complication rate 15.4%) are in accordance with those present in the literature^(5, 8).

Wound infection is a major concern in cochlear implant surgery. The overall rate of infections reported in the literature ranges from 1.7 to 16.6%^(5, 9-12). In our study, the overall rate of infection was 6.8% (5.1% between the early, and 1.7% between the late ones).

When the infection was a complication of acute otitis media, medical treatment has been successful. Acute otitis media or acute mastoiditis in the implanted ear should be treated as done in non-implanted ears. Antibiotics should be administered intravenously and a few days longer than for ears without implants⁽⁸⁾.

On the other hand, explanation was always performed after intensive medical therapy failure, as in the cases of pseudomonas aeruginosa infection.

In cases of severe acute otitis media, removal of the cochlear implant is necessary to permit healing⁽⁹⁻¹²⁾.

It is recognized that some pathogens can colonize on the implant device surface also inducing biofilm formation; at this point, only explanation can ensure the infection eradication⁽¹³⁻¹⁵⁾.

No cases of meningitis were observed in our study, and the incidence is also very low in the literature⁽¹⁶⁻²⁰⁾.

Facial nerve paralysis following cochlear implant surgery was 0.71% and our data are not accordance with those present in the literature⁽²¹⁾. In our study facial nerve paralysis was (1.1%).

Two cases of reimplantation are present in our study(1.1%). And our data are in accordance with those present in the literature⁽⁵⁾.

CONCLUSION

Cochlear Implant surgery has been demonstrated to be a relatively safe technique with little associated comorbidity.

It can now be offered as a solution for profound hearing loss problems to a greater number of patients and to younger children, which in turn ensures a greater quality of life.

It is therefore a surgery with a good risk-benefit ratio, with an acceptable rate of medical complications that can be resolved with conservative handling in a satisfactory manner^(5,9,16-21).

In light of the good results obtained with this surgery, it is necessary for all centers dedicated to cochlear implantation to know, study and record their complications and failures. To the extent that these are better classified and reported, there will be better conclusions regarding the diagnosis and handling of this type of problems. Consequently, technological advances and better medical and surgical knowledge by the otorhinolaryngologists will make this surgery safer every time.

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