Delayed Recurrent Post Cochlear Implantation Hydroma: A Four Patients Series

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ABSTRACT

Objective: we report our series of late hydroma after cochlear implantation, this complication has not been widely reported in the literature. Method: retrospective study.

Results: four children who had undergone a cochlear implantation aged between 3.2 and 5.3 years (median 4.5 years) were studied. The hydroma episode occurred 4 months to 3 years after cochlear implantation. Two patients had two recurrent episodes. No obvious etiological factors were found, including trauma or infection. No patient benefited from a fine needle aspiration or drainage, all the patients were treated with a broad-spectrum antibiotic with corticosteroid and a slightly compressive bandage with good results in all cases.

Conclusion: Late-onset hydroma is a minor complication with no obvious etiology and good evolution and risk of recurrence, its management remains no codified due to the limited number of cases reported in the literature.

Keywords: Cochlear Implant; Complication; Hematoma; Hydroma.

I. INTRODUCTION

Cochlear implantation has become a common procedure performed for management of bilateral severe to profound sensorineural hearing loss. The complications of cochlear implantation are generally low and are classified as major or minor [1]. Among these complications, some patients recurrently develop late hydromas covering the subcutaneous region of the implant. Usually, these hydromas occur at an early stage in 0.4 to 3.7% [2]. It is a minor complication but can have serious consequences if not properly managed, with risk of secondary infection and total extrusion of the implant [2]. The aim of this study is to present our experience with a series of four children who developed late and recurrent hydroma several months after surgery.

II. PATIENTS AND METHODS

It is a retrospective study over a period of five years between 2014 and 2019. Only patients who have had a cochlear implantation in our department, and who have presented a late spontaneous hydroma has been included. The study has been focalized on demographics, clinical presentation, radiological assessment, treatments, and evolution data.

III. RESULTS

Four patients were included in our study from 100 patients implanted during this period. In all cases the hydroma has been detected after complete healing of the surgical wound. All patients were children and two of them have had two recurrences (see Table I). The age of cochlear implantation has been between 3.2 years and 5.3 years (median 4.5 years). The Cochlear implantation was unilateral in all cases and according to a standard technique with creation of a subperiosteal lodge and fixation of the implant without bone drilling. All the implants were from Oticon MEDICAL: three Digisonic SP and one Neuro ZTI EVO. The first episode of hydroma has occurred between 4 months to 2 years after surgery (see Table I). Among the patients who has had recurrence. In the first case, the recurrence has been occurred after 2 years and in the second case, 3 years after. No history of coagulopathy, or head trauma has been reported. All patients had recent swelling around implant, with tenderness, without pain nor fever or inflammation or skin lesion. No
patient had evidence of upper respiratory tract infection or other signs before or at time of the occurrence of the hematoma. We have noted difficulties in attaching the magnet Fig. 1. No implant failure has been noted. The Blood biological analyzes carried particularly blood count and CRP has been normal. None of our patients had a fine needle aspiration or incision of the hydroma. Only one patient had a CT scan which has been difficult to interpret because of artifacts. In the other cases, we have used an ultrasound study that has demonstrated a sub-facial collection on the outer side of the implant. All patients had prophylactic antibiotics. Amoxicillin / clavulanic acid has been the antibiotic of choice with a dose of 80 mg/kg/day for one week with corticosteroids: prednisolone 1 mg/kg/day for 5 days. All patients had a compression bandage applied to hematoma. The bandage was changed regularly every 48 hours until the hydroma disappeared completely. Full resolution was obtained for all episodes; average resolution time has been 4 days (between 2 days and 7 days). No complications have been noted, no infection, no skin lesion, no implant failure.

**TABLE I: CLINICAL AND EVOLUTION DATA OF PATIENTS**

| Patients | Implantation age | Device type | First episode | Second episode |
|----------|------------------|-------------|---------------|----------------|
|          |                  |             | Occurrence date | Resolution | Occurrence date | Resolution |
| 1        | 4y 5m            | Digisonic SP| 7m            | 2d          | 2y 8m          | 5d          |
| 2        | 5y 2m            | Digisonic SP| 9m            | 4d          | 3y             | 3d          |
| 3        | 3y 2m            | Neuro Zhu E | 2y            | 3d          | -              | -           |
| 4        | 5y 1m            | Digisonic SP| 4m            | 7d          | -              | -           |

y: years; m: Month; d: day; occurrence date: after implantation.

**IV. DISCUSSION**

Hydromas are a minor complication usually described a few days after cochlear implantation or bone-anchored device implantation [3, 4]. Spontaneous and recurrent delayed form is a phenomenon rarely reported in the literature. Its etiology remains uncertain with a difficult to estimate the incidence [5, 6]. Of 22 subjects with post-cochlear implant hydroma, Filipo and all reported four delayed cases. Three had a head trauma and one had a coagulopathy [2]. Low and all had one case of coagulopathy in a series of five delayed hydromas [6].

In our series, no patient had a history of head trauma or coagulopathy. A differential diagnosis to consider is CSF leak and accumulation that can take place months after cochlear implantation [7]. Horton et al reported two cases of secondary collection due to CSF leak, one and four months after cochlear implantation [7]. In our series, CSF leak was not suspected because in our cases no bone drilling has been performed and all collections are on the external side of the implants. Infectious origin was not suspected in our patients due to absence of fever and local inflammation and the negativity of C-reactive protein and normal blood count. Low and all have reported one case of infection by the coagulase-negative Staphylococcus aureus which has been diagnosed by the culture of aspiration fluid [6].

Hydroma is distinguished from abscess by the absence of infectious signs and skin lesions [3]. All of our cases are children as in the series reported by Nash and Low [5, 6]. No obvious cause of these hydromas was found in our series. The role of upper respiratory infections, affecting children, suggests the possibility that these hydromas develop as part of an abnormal immune response to a viral infection [5]. Minor head trauma raises another possible etiology [5]. Some small hydromas are asymptomatic and can disappear spontaneously. However, symptomatic hydromas are often revealed by an acute onset swelling that interferes with wearing external processor [6]. All of our patients received minimal investigations to rule out infection, imaging was not done in routine. Faced with the often lack of etiology, Nash and all does not routinely recommend thorough investigations except to eliminate an abscess [5]. Likewise, the usefulness of antibiotics in this situation is difficult to assess [5]. Management of his hydromas is not elaborated in literature, prescription of antibiotic therapy is not systematic, but it is recommended due to the fear of infection on implant especially for the first episode but is not necessary for recurrence [5]. Aspiration with a compression bandage has been used successfully as a first-line treatment by Low and Nash [5, 6], and drainage under general anesthesia as a second-line for Low [6]. In our series, antibiotic therapy with corticosteroid and compression bandage has brought healing. No aspiration or drainage has been necessary in our series.

**V. CONCLUSION**

Delayed spontaneous hydroma is a complication that occurs frequently in patients, and it is rarely described in literature. Its etiologies remain to be found. It must be distinguished from abscess and CSF leak. Management includes monitoring, with a compression bandage and antibiotic therapy. Aspiration, incision, and drainage with strict asepsis may be helpful for immediate and effective resolution.
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