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Hematoma 15 Years After Cochlear Implantation: A Rare Case Report

Koklear İmplantasyondan 15 Yıl Sonra Ortaya Çıkan Hematom: Nadir Bir Olgu Sunumu

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ABSTRACT

Cochlear implantation (CI) is a safe procedure. Complications are rare but they can be fatal such as meningitis. Hematoma following CI is uncommon with a prevalence of 0.9%. To the best of our knowledge only few cases were reported in medical journals in English pertaining to hematoma following CI. We present an 18 year-old female with hematoma fifteen years after CI surgery, treated with needle aspiration under ultrasound guidance, antibiotic, and mastoid pressure dressing.

Keywords: *Sensorineural hearing loss, cochlear implantation, hematoma, ultrasound*

ÖZ

Kohlear implantasyon (KI) güvenli bir cerrahi işlemdir. Komplikasyonları nadir olmakla birlikte, menenjit gibi ölümcül de olabilmektedir. KI sonrası hematom seyrek görülmekte olup, prevelansı %0.9'dur. Bildiğimiz kadarıyla İngilizce dergilerde KI sonrası hematom ile ilgili yalnızca birkaç olgu bildirilmiştir. Bu olgu sunumunda, KI cerrahisinden 15 yıl sonra hematom gelişen ve ultrason eşliğinde iğne aspirasyonu, antibiyotik ve baskılı mastoid sargı ile tedavi edilen 18 yaşında bir kadını sunduk.

Anahtar kelimeler: *Sensörinöral işitme kaybı, koklear implantasyon, hematom, ultrason*

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INTRODUCTION

Cochlear implantation (CI) has been established and viably utilized in the sound-related recovery for severe to profound sensorineural hearing loss in youngsters and grown-ups. Medical procedure of CI is viewed as a moderately conservative methodology in experienced specialist. Complications of CI can be considered as major and minor problems.

Here, we report a case of an 18-year-old girl with bilateral congenital and profound sensorineural hearing loss who had right cochlear implant surgery when she was 3 years old. She presented with recurrent swelling at the right cochlear implant receiver site. Ultrasound showed anechoic collection superficial to the cochlear implant. She was treated with intravenous antibiotic and mastoid bandage at initial stage. However due to recurrent swelling she had to undergo ultrasound-guided needle aspiration.

CASE PRESENTATION

An 18-year-old girl with bilateral congenital and pro-

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found sensorineural hearing loss (SNHL) had a right cochlear implant placed when she was 3 years old. Any complication of CI procedure did not occur and she has been compliant with the cochlear implant device. Currently she presented to us with recurrent swelling at the recipient site.

The first episode occurred in April 2016 when she was 18 years old. The second episode was in May 2016 whereby she presented with 3 days swelling at the right CI recipient site which was painful upon touch. There was no fever, headache or vomiting. No discharge from swelling. No significant history of direct trauma to the recipient site was revealed except for using headphone prior to the event for 1 month. The cochlear implant at that point of time was functioning normally, and she was able to attach the external processor to the recipient site. Clinical examination showed the presence of a post auricular fluctuant swelling measuring 3 cm x 3 cm which was tender on palpation. Overlying skin was not erythematous or warm.

Otoscopic examination was unremarkable. Total white cell count and C-reactive protein were not elevated. Ultrasound of the right temporal region showed that there was an anechoic layer measuring 0.2 cm x 4.5 cm (depth x length) seen superficial to the site of right CI without any debris or septation (Fig 1). Any increase in Doppler signal and any other focal lesion were not seen. Thus a diagnosis of seroma was made. She was admitted and intravenous amoxicillin/clavulanate (Augmentin) infusion with regular analgesic was initiated and continuous pressure dressings were applied to the right mastoid. Her right mastoid swelling and pain clinically reduced after 4 days. She was then discharged with oral Augmentin for another 6 days to complete a total of 2 weeks of antibiotic. She was seen in outpatient clinic one week after discharge on which the swelling completely resolved. She was recalled at a later date for a clinical visit to monitor her condition.

Approximately 1 month after her last hospitalization, there was a recurrent swelling at the same site which lasted for 2 weeks. She experienced a mild pain for 1 day which is a week before appointment without any significant trauma history of significant trauma. There was no otalgia, otorrhea and no discharge from the swelling. She had no fever, headache, vomiting or any signs suggesting upper respiratory tract infection. Clinical examination revealed a post auricular fluctuant swelling measuring 4 cm x 5 cm. It was tender to touch however the overlying skin was not erythematous or warm. Otoscopic examination was unremarkable. She was admitted and started on intravenous IV Augmentin as well as regular analgesic. Blood investigation showed that total white cell count and C-reactive protein were not elevated. Thrombocytopenia was not seen and her coagulation profile were within the normal range. An ultrasound-guided needle aspiration performed on her day 2 of admission. There was an anechoic collection superficial to the cochlear implant and 7 ml of stagnant blood was aspirated. A diagnosis of hematoma was established. Both aspirates were sent for culture and sensitivity tests however bacterial growth was not seen. A compressive mastoid bandage was immediately applied onto the right mastoid region for a total of 3 days. The mastoid bandage was removed and swelling was observed to recur 2 days after removal of mastoid bandage. Thus mastoid bandage reapplied. She was discharge on day 7 after hospitalization with compressive mastoid bandage and given oral Augmentin for 7 days to complete a total of 2 weeks of antibiotic.

She was seen in clinic 4 days after the second hospitalization. She was compliant to the compressive mastoid bandage application. There was residual swelling at the right mastoid region which was smaller in size. She had no pain during this visit and no symptoms to suggest progression of the hematoma. Examination showed a smaller size swelling (2x2 cm) at the recipient site. Overlying skin was not inflamed and other clinical examination findings were unremarkable. She was arranged for a day procedure of ultrasound-guided aspiration during the visit. A 1.5 ml of stagnant blood was aspirated from the same site (Fig. 1). She was discharged well from a day pro-

cedure. The mastoid bandage was removed and oral antibiotherapy regimen was completed.

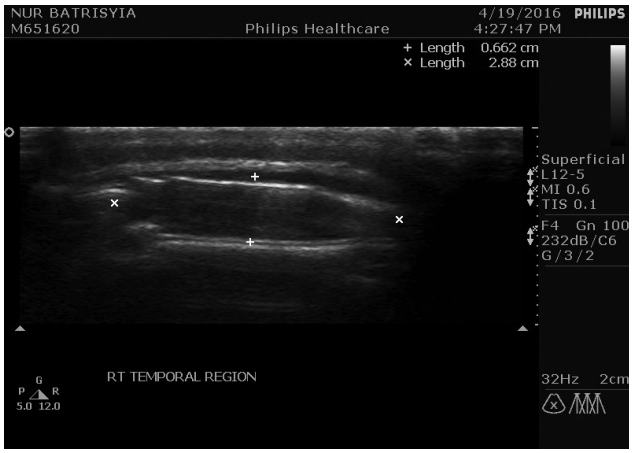

Figure 1. Shows an ultrasonography of Right Temporal Region. Scalp sonography with the probe positioned superficial to the recipient site of right cochlear implant exhibited an ovoid anechoic lesion measuring 2.8 cm. There was no internal echogenicity detected to suggest debris or septation. Doppler interrogation revealed no significant signal uptake.

She was given an early follow-up appointment in a week however it was defaulted due to her colleague commitment. She then returned for a clinical visit almost 10 months later. There was no more swelling at the right CI recipient site and she was compliant to her CI usage. Currently patient is under regular follow-up, and her condition is still being observed.

DISCUSSION

Cochlear implant is an established treatment for severe to profound sensorineural hearing loss. It has a low complication rates of 5.7 percent. CI complications can be classified as major and minor complications. Post-CI hematoma is a minor complication whereby its prevalence is relatively low (0.9%)[1]. Minor complications have a tendency to resolve with a conservative medical management which would not affect the function of the implant and quality of life of the patient. Despite being classified as a minor complication, if it is not vigilantly managed, it can cause a serious morbidity such as infected hematoma which may lead into a total extrusion of the implant[5].

Significant complexities of cochlear embed medical procedure incorporate cochlear anode default, meningitis, complications for example, skin infection at the implantation site, middle ear disease requiring revision medical procedure on account of flap necrosis, and serious sequelae, for example, perpetual facial loss of motion. Minor complications are those that can be managed with minor interventions with therapeutic or audiological medications, for example, wound disease or non-sound-related complications A few large-scale investigations have reported low rates of intraoperative and additionally postoperative complications[1-3]. The general prevalences of long-term complications after post cochlear implantation is 5.7%, including mostly vestibular complications (3.9%) then; device failure (3.4%) and changed taste (2.8%). Less frequently seen complications include cholesteatoma (0.5%) and facial nerve paralysis (0.6%). While the prevalence of post CI hematoma is only 0.9%[1]. To the best of our knowledge only few cases reported in medical journals in English pertaining to hematoma following CI. Loundon et al.[1] reported 3 cases of hematoma and related skin flap infections in their study of 434 patients. While Ovesen et al.[2] reported 1 case of hematoma in their study of 313 patients. Low WK et al.[4] reported a series of 5 patients with delayed onset hematoma following CI procedure who were treated surgically mainly with needle aspiration, incision and drainage or combination of both procedures.

We report a case of 18-year-old-girl with delayed onset hematoma. She had unilateral CI when she was 3 years old due to bilateral congenital profound SNHL. Intriguingly, the first onset of hematoma formation at the cochlear implant site develops after 15 years after CI. Loundon et al.[2] reported three patients who developed delayed hematoma within 6 months after CI procedure. Filipo et al.[5] conducted a study and specifically investigated complication of post CI hematoma comprising a total of 22 pediatric, and adult patients. The average onset of hematoma formation ranges from 2.5 days to 4 years after CI procedure. Low WK et al.[4] reported 5 patients who developed hematoma 2-12 years (median, 6

years) after CI procedure He had 2 patients who developed late-onset hematoma 11 and 12 years post CI,respectively. Googe et al.[6] reviewed 248 cases of pediatric cochlear implantation and reported 2 cases which developed seroma 10 and 12 days after the CI procedure, respectively.

It is vital to identify the predisposing factor of hematoma and seroma post CI procedure hence for an institution of an accurate management. Filipo et al.[5] reported a detailed study of 22 patients who developed hematoma and their predisposing factors. They were categorized into 4 groups. Group A developed hematoma due to coagulation disorders. Group B developed hematoma due to trauma. Group C developed hematoma after revision surgery. Group D, had unknown etiology. Low WK et al.[4] reported 5 patients of post CI hematoma with 4 patients without any known etiology. While the fifth patient had coagulation disorder. In our case, she had no prior significant history of trauma and no bleeding tendencies. She was able to use her device well since its implantation when she was 3 years of age. Any revision surgery was not performed. Blood analysis showed that inflammatory marker was not elevated and coagulation profile was within normal range. Thus we categorized this case as a case of unknown etiology.

In terms of managing hematoma formation at the CI site patient was promptly attended. Intravenous broad spectrum antibiotic (Augmentin) was started with application of mastoid pressure dressing for 48-72 hours. Ultrasound showed a 0.2 cm anechoic collection superficial to CI. She responded 2 weeks of total antibiotherapy and 48-72 hours of mastoid compression bandage. However, swelling recurred within 1 month after initial treatment, so she underwent ultrasound- guided needle aspiration which drained 7 ml and 1.5 ml of stagnant blood consecutively. Intermittent mastoid pressure dressing was applied for a longer period of time on her second treatment. Thus 48-72 hours prior and after ultrasound- guided needle aspiration with total of 2 weeks of antibiotherapy. Filipo et al.[5] advocated wait and scan technique if ultrasound shows a collection of <3 mm. In contrary, if it is ≥3 mm then needle aspiration is indicated. Incision and drainage is reserved for ultrasonographic evidence of partial fibrosis. Low WK et al[4]. performed an incision and drainage after 2 days of persistent swelling post initial treatment with needle aspiration, intravenous antibiotic and mastoid pressure dressings. Qin F et al.[7] treated 20 cases of subperiosteal hematoma with pressure dressing and antibiotic for 2 weeks with complete recovery. Drainage is suggested for large hematoma collection. Other authors[2,6,8] suggested local dressing and antibiotherapy, and they observed complete resolution. In contrary, we observed a complete recovery in our patient after multiple intermittent mastoid pressure dressings with needle aspiration and prolonged administration of antibiotic.

The mastoid pressure dressing is an essential adjunct to treatment of post CI hematoma. We applied mastoid pressure for 48-72 hours as initial treatment. After she came back with recurrent swelling, mastoid pressure dressing was applied for longer periods namely 48-72 hours before and after the needle aspiration. Low WK et al.[4] applied pressure dressing for about 24 hours after each needle aspiration and incision and drainage on which patient had complete resolution. Loundon et al.[2] and Qin F et al.[7] advocate the use of local pressure dressing in their studies however specific duration was not mentioned. While on the contrary, some authors[5,6] treated their patient without applying the pressure dressing. We suggest a longer application of mastoid pressure dressing for 24-72 hours.

To the best of our knowledge there is no available data reported in medical journals published in English literature regarding the specific class and duration of antibiotic institution for treatment of hematoma post CI procedure.

CONCLUSION

In conclusion, post hematoma complication post cochlear implantation has varying time frame in its development, as early as days up to years due to

multiple etiologies such as trauma, coagulopathy, and of unknown cause. A prompt recognition and treatment must be instituted to patient who is diagnosed to have hematoma post CI to prevent further complication. We recommend a longer use of mastoid compression bandage for 48-72 hours in adjunct with needle aspiration under ultrasound guided.

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