

Periorbital Ecchymosis: An Uncommon Complication of Cochlear Implantation

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Abstract

Background: Cochlear implantation in recent years had been a final treatment for those with severe sensorineural hearing loss. Cochlear implantation is a safe procedure, due to development of science and technology the complication of cochlear implantation is decreasing. Unusual and uncommon complications are unpredictable and managed with extra conscious because these complications may lead to revision surgery.

Case Report: In this case we report an uncommon complication of periorbital subcutaneous ecchymosis in a four and half year old Chinese boy after cochlear implantation. After the treatment with anti-inflammatory hemostatic agent the patient recovered and within two weeks the ecchymosis completely disappeared.

Conclusion: Cochlear implantation is comparatively a safe surgical procedure with minimum chance of complications, sometime complications like periorbital ecchymosis may be frustration during postoperative management as such complications may mimic presence of other traumatic illness, so adequate anatomical knowledge and surgical skills are very important during management.

Keywords: Cochlear implantation; Periorbital ecchymosis; Postoperative complications

Introduction

Cochlear implantation has become a common procedure for the children having suffered a bilateral severe-to-profound sensorineural hearing loss those who with little or no benefit from hearing aids. There had been many major and minor complications reported. Although cochlear implantation is relatively safe procedure and the advancement of medical technology, manufacturing new advance cochlear implant devices, high quality of surgical skills, still there are various complications of cochlear implantation so surgeons performing cochlear implants should have adequate knowledge about medical and surgical complications relating to cochlear implantation.

Case Report

A four and half year old Chinese boy is admitted in our department for the elective cochlear implantation. The parents complain of child's no response to sound for more than 4 years and did not speak any meaning full words in spite of using hearing aid and speech and language training. Worried parents took the child to outpatient department of our hospital where child received all the required screening tests and examination for hearing evaluation. ABR recorded no response at 109.6 dBnHL, DPOAE, autoacoustic emission were not illucited, tympanometry examination recorded was C type tympanogram, hearing sense was grade 0, hearing and recognition test was grade1, temporal bone CT scan showed no abnormalities (Figure 1). After the entire required test showed no any surgical contraindication. Patient performed right ear cochlear implantation via facial recess approach [1-10]. Intraoperative ART and NRT showed

values with in normal range C-arm X-ray imaging showed electrode arrays implanted with in cochlea (Figure 2).

On first postoperative day, patient mother complained of periorbital discoloration of the skin (Figure 3). Ophthalmologic department consultation was done. Advised temporal CT, hemostatic treatment, warm compression treatment. Temporal CT showed no skull base fracture and orbital trauma, subcutaneous potential space was seen in the surgical site and a tract leading towards orbit (Figure 4). The Patient was treated with anti-inflammatory hemostatic agent and was discharged on 8th postoperative day. On the follow-up examination on 15th day found the disappearance of periorbital ecchymosis (Figure 5).

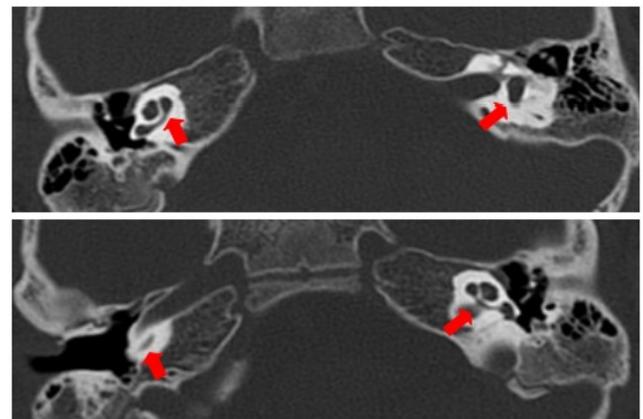


Figure 1: Pre-operative axial CT scan images showing normal scan.

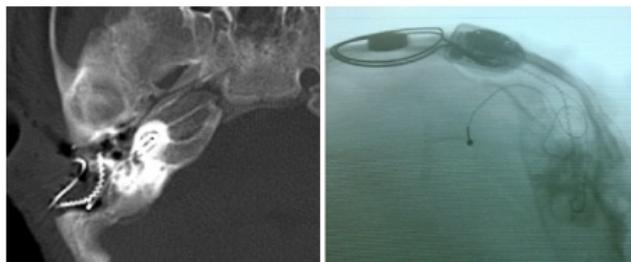


Figure 2: Intraoperative c-arm X-ray images showing electrode array inserted within cochlea.



Figure 3: Post-operative day 1 showing periorbital ecchymosis.

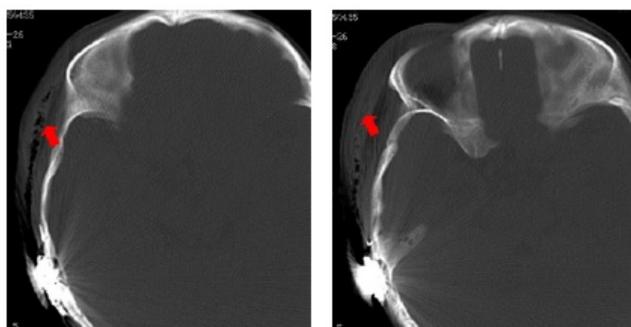


Figure 4: Post-operative day 1 axial CT scan images (red arrow showing subcutaneous potential space and a tract leading towards orbit).

Discussion

Cochlear implantation is a safe procedure, although a variety of complications have been reported, complication rate ranges from 6% to 20%[1]. These complications are broadly divided into major and minor complications. Major complications usually have to do with surgical technique and include flap necrosis, improper electrode placement, and rare facial nerve problems. Minor complications include dehiscence of incisions, infection, facial nerve stimulation, dizziness, and pedestal problems with the device [2]. Flap necrosis or wound dehiscence, is the most common complications with an incidence of 4.5 to 11.2%, major complications are those requiring

further surgery or hospitalization, occur at rates 2.1 to 11.7% whereas minor complications are those which can be treated with medical management, have a slightly higher incidence, 5.8 to 25.4% [3,5]. Even if the complications are rare they should be carefully assessed. Complications such as cochleitis or labyrinthitis, with fibrosis or ossification that could be serious, frequency of complications has consistently declined over the last 15 years settling and, to date is approximately 15% among cochlear implant patients [1].

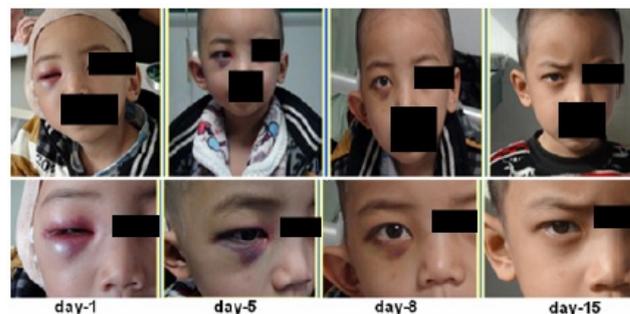


Figure 5: Post-operative images of gradual disappearance of periorbital ecchymosis. (Images published with permission).

In a retrospective study conducted by Lu and Cao in 25 cochlear implant surgeries found the causes of re-implantation were hard failures, poor implanted electrodes position, poor outcome, skin flap infection lead to implant device exposure, postoperative symptoms of facial nerve stimulation, and postoperative temporal bone lesions [6].

Periorbital ecchymosis, a purple discoloration of the periocular skin due to the collection of blood into the subcutaneous tissues, is most commonly found in the setting of periorbital trauma and surgery [7]. It is most commonly associated with skull base fractures. It is caused by blood tracking along tissue plains into periorbital tissues, causing discoloration in the upper and lower eyelids [8]. When there is fracture of skull base or other trauma in the orbital region bleeding into orbit organizes around the periorbital subcutaneous tissue, which is loose and easy to form extensive blood stasis.

Kavoussi et al. mentioned the other causes of periocular ecchymosis: the spontaneous appearance of periocular ecchymosis in children can indicate the presence of life-threatening conditions including pediatric malignancies (neuroblastoma, rhabdomyosarcoma, leukemia) and hematologic disorders (aplastic anemia, thrombocytopenia), vascular malformations (capillary hemangioma, lymphangioma, and orbital varix), inflammatory conditions (orbital myositis, amyloidosis), and pertussis [9].

While performing any surgery in the temporal region of head careful attention should be paid for intraoperative bleeding and elevation of soft tissue. Surgeon performing cochlear implant should be aware about the soft tissue layers of temporal region. From superficial to deep, the soft tissue layers of the temporoparietal region include: temporoparietal fascia, loose areolar tissue plane, superficial leaflet of temporal fascia, fat pad of temporal fascia, deep leaflet of temporal fascia, fat pad deep to temporal fascia, temporalis or temporal muscle, and pericranium [10].

Conclusion

We presented a rare complication of cochlear implantation. Periorbital hemorrhage may be the sign of other underlying traumatic condition. As most of the cochlear implant recipients are children and the history provided they may not be adequate to rule out other cause of periorbital ecchymosis, this may lead to misdiagnosis and mistreatment. So during cochlear implantation extensive elevation of periosteum and other subcutaneous tissue must be avoided to avoid such complication. In case of intraoperative bleeding tight pressure bandage should be applied, especially in case of children as the subcutaneous structures around temporal region is not compact and blood may accumulate in the potential space between these structures. In such case we recommend the use of strong anti-inflammatory hemostatic agent and heat compression, the accumulated blood will resolve within 2 weeks.

Consent

Written informed consent was obtained from the patient for publication of this Case report and any accompanying images.

Competing Interests

None, No any financial support received.

Authors' Contributions

All authors equally contributed in writing the case and giving care to the patient.

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