Section: Otorhinolaryngology

Case Report

A RETROSPECTIVE STUDY ON POSTCOCHLEAR IMPLANT FLAP-RELATED COMPLICATIONS AND THEIR INTERVENTION IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Cochlear implantation is a safe and effective treatment for severe-to-profound sensorineural hearing loss, but postoperative flap-related complications may affect wound healing and implant survival. These complications include seroma, wound dehiscence, flap necrosis, and implant exposure, and are often related to impaired flap vascularity, wound tension or local infection. The clinical features include erythema, swelling, wound gaping, and, in severe cases, device exposure. Management ranges from conservative treatment to surgical reconstruction, depending on the severity. The temporalis myofascial flap is a reliable option for salvaging implants in cases of full-thickness flap necrosis. We report three cases of flap-related complications following cochlear implantation, all successfully managed with appropriate interventions, including temporalis myofascial flap reconstruction, resulting in stable wound healing and preservation of the implant.

INTRODUCTION

Cochlear implantation (CI) is the standard of care for severe-to-profound sensorineural hearing loss that cannot be managed by hearing aids and has broad access to auditory rehabilitation worldwide.[1] WHO estimates that over 430 million people currently require rehabilitation for disabling hearing loss, and it is expected to reach over 700 million by 2050.[2] Advances in implant design, surgical technique and perioperative care have made the management of infants, elderly patients and those with complex otologic anatomy also possible.[3] CI has high overall success and improves communication and quality of life, but it is an otologic/skull-base procedure, and has surgical, medical and device-related risks. Postoperative complications are commonly categorised as minor (wound infection, transient vertigo, tinnitus, transient facial paresis) and major (flap necrosis, implant extrusion/sepsis, device failure requiring reimplantation, meningitis, electrode misplacement).[3,4]

Among these, flap-related problems (haematoma, seroma, wound dehiscence, necrosis, and exposure) are important because they increase morbidity, may require additional procedures, and can delay auditory rehabilitation.[5] Reported rates of flap/delayed skin complications and re-implantation patterns vary between centres, due to the influence of incision type, surgical technique, and local infection control practices.[5,6] In this retrospective case series, we have described the postoperative flap-related complications, risk factors, management strategies, and outcomes after CI at our tertiary hospital.

CASE PRESENTATION

Case 1: A 5-year-old male child with profound sensorineural hearing loss underwent unilateral CI at our tertiary care centre. The immediate postoperative period was uneventful. On the 5th postoperative day, the patient developed seroma formation at the surgical site, associated with erythema and local swelling. He was treated with intravenous antibiotics, following which the local inflammatory signs subsided. On the 14th postoperative day, the patient presented with wound dehiscence (wound gaping) at the postauricular incision site. The patient underwent secondary suturing under aseptic precautions and continued intravenous antibiotics. On the 25th

postoperative day, the patient again developed wound gaping with exposure of the implants [Figure 1]. Wound swab sent for culture and sensitivity showed no bacterial growth. The child was also noted to have plagiocephaly, which may have contributed to compromised wound healing and local flap tension. The patient underwent revision surgery with temporomyofascial flap reconstruction to provide adequate soft-tissue coverage over the implant. Postoperatively, the flap remained healthy, the wound healed well, and there were no wound complications. The patient made an uneventful recovery and was declared cured with the preservation of the implant. [Figure 2 & 3]

Figure 1: wound dehiscence

Figure 2: intraoperative elevation of flap

Figure 3: intraoperative rotation of flap

Case 2

A 3-year-old male child with profound sensorineural hearing loss underwent unilateral CI at our tertiary care centre. On the 3rd postoperative day, he developed a seroma at the surgical site associated with erythema and local swelling, which was treated with intravenous antibiotics. On the 13th postoperative day, the patient presented with wound dehiscence (wound gaping) and exposure of the implant. The patient underwent temporomyofascial flap reconstruction to provide adequate soft tissue coverage for the implant. Two weeks after flap reconstruction (31st postoperative day), the patient developed wound gaping with implant exposure, with recurrent flap necrosis. [Figure 5] A wound swab sent for culture and sensitivity showed no bacterial growth. The patient also had plagiocephaly, which may have contributed to local wound tension and impaired healing. The patient underwent revision flap reconstruction for definitive implant coverage. Postoperatively, the revised flap remained healthy, the wound healed satisfactorily, and no wound-related complications occurred. The patient made a good recovery and was declared cured after successful salvage of the implant.

Figure 4: wound gaping on postoperative day 13

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Figure 5: recurrent fap necrosis on postoperative day 31

Case 3

A 2-year-old male child with profound sensorineural hearing loss underwent unilateral CI at our tertiary care centre. On the 6th postoperative day, a seroma developed at the surgical site associated with erythema and local swelling, which was treated with intravenous antibiotics. On the 14th postoperative day, the patient presented with wound gaping and exposure of the implant [Figure 6].

Figure 6: Postoperative wound dehiscence with implant exposure

The patient underwent flap reconstruction to provide adequate soft tissue coverage of the implant. Postoperatively, the flap remained healthy, and the wound healed well [Figure 7 and 8].

Figure 7: Intraoperative elevation and rotation of the temporalis myofascial flap

A wound swab sent for culture and sensitivity showed no bacterial growth. Plagiocephaly was observed, which may have contributed to the local wound tension. The patient had an uneventful recovery and was declared cured with preservation of the implant.

Figure 8: Postoperative wound closure with healthy flap

DISCUSSION

This retrospective case included three patients who underwent CI surgery in the Department of ENT, Kanyakumari Government Medical College, Asaripallam, between March 2015 and March 2025. CI is a well-established and safe procedure, yet postoperative complications, though infrequent, continues to affect surgical outcomes, device survival, and patient quality of life.[3] Flap-related complications, particularly flap necrosis and wound dehiscence, are some of the most difficult

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postoperative issues in CI surgery.[6,7] These complications often arise from compromised vascularity of the postauricular skin, which can be aggravated by excessive tension on the flap, aggressive soft-tissue elevation, hematoma/seroma formation, infection, and local pressure effects from the implant housing.[6] Patient-specific factors such as young age, thin or scarred skin, previous surgeries, poor hygiene, chronic otitis media, diabetes, and immunosuppression may predispose to wound breakdown. While the incidence of major skin flap complications is low (1.08-8.2%), flap necrosis remains an important cause of device exposure and implant extrusion.[6,8]

Early signs of flap compromise often include erythema, localised swelling, tenderness, delayed wound healing, and small areas of dehiscence. These manifestations are due to soft tissue inflammation and impaired vascularity, which, if not addressed, may progress to full-thickness flap necrosis and implant exposure.[6,9] When soft tissue compromise occurs, local bacterial colonisation can further complicate healing. Common pathogens in postoperative wound problems include Staphylococcus aureus and Pseudomonas species, and persistent infection may promote biofilm formation on exposed implant surfaces, increasing the difficulty of salvage.[10] The major complication reported in our cases was flap necrosis, which was managed with temporalis myofascial flap reconstruction. Minor flap ischaemia or superficial dehiscence can be managed with antibiotics, improved hygiene, and pressure relief measures. Necrosis requires surgical intervention, including rotational or advancement flaps, temporalis fascia grafting, and local transposition flaps with a robust vascular supply. When flap salvage is unsuccessful or infection is deep-seated, implant explantation followed by revision surgery after infection control may be required.[6,10,11]

The temporalis myofascial flap is a reliable and versatile salvage option for managing severe post–CI wound complications, particularly full-thickness flap necrosis with implant exposure. This technique involves elevating a pedicled temporalis muscle–fascia unit from its temporal origin and rotating it inferiorly or posteriorly to cover the exposed receiver. It provides a thick, well-vascularised cushion that improves local perfusion and reduces the risk of recurrent breakdown. The TMF has been reported to be useful in extensive skin loss, thin paediatric scalp, chronically infected or scarred fields, and after failed prior revisions, where simple skin or local scalp flaps are unreliable. There was stable wound healing and implant preservation, with low donor-site morbidity.[6,9,12]

CONCLUSION

Cochlear implantation is a safe and effective procedure; flap-related complications such as seroma, wound dehiscence, flap necrosis, and implant exposure, though rare, can affect the implant survival if not managed properly. Early soft tissue complications were the most common presentations. Post-surgical flap complications, such as swelling with erythema and wound gaping with implant exposure, can significantly impact recovery in paediatric CI patients. Early identification and appropriate surgical management, including flap reconstruction, are essential for ensuring successful outcomes.

REFERENCES

1. Sharma S, Shah DN. Hearing disorders. International Encyclopedia of Public Health. Elsevier 2025;4:523–37. https://doi.org/10.1016/B978-0-323-99967-0.00179-4.
2. Deafness and hearing loss. WHO 2025. https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss.
3. Neagoş CM, Nenec BG, Neagoş A, Sin A. Complications in cochlear implant surgery: a comprehensive review. J Med Life 2025;18:939–45. https://doi.org/10.25122/jml-2025-0009.
4. Swain SK. Complications of cochlear implant surgery: a review. Int J Otorhinolaryngol Head Neck Surg 2025;11:642–8. https://doi.org/10.18203/issn.2454-5929.ijohns20253004.
5. Qin F, Li W, Qiu J, Zhang L, Zhong M. After cochlear implantation: Complications related to flap around implants. J Otol 2016;11:198–201. https://doi.org/10.1016/j.joto.2016.12.001.
6. Bi Q, Chen Z, Lv Y, Luo J, Wang N, Li Y. Management of delayed-onset skin flap complications after pediatric cochlear implantation. Eur Arch Otorhinolaryngol 2021;278:2753–61. https://doi.org/10.1007/s00405-020-06348-2.
7. Naas A. Flap complications after cochlear implant. Online J Otolaryn Rhinol 2022;5(3). https://doi.org/10.33552/ojor.2022.05.000613.
8. Radef Dawood M. Postoperative complications of cochlear implant surgery in children. Balkan 2025;2:82–5. https://doi.org/10.5152/bohns.2025.25100.
9. Kang JK, Lee JS, Suh M, Lim GC, Shin MS, Yun BM. Reconstruction of a scalp defect due to cochlear implant device extrusion using a temporoparietal fascia flap and a split-thickness skin graft from the scalp. Arch Craniofac Surg 2019;20:319–23. https://doi.org/10.7181/acfs.2019.00353.
10. Kim YH, Cho SI. Skin flap necrosis by bone marking with methylene blue in cochlear implantation. J Audiol Otol 2015;19:108–10. https://doi.org/10.7874/jao.2015.19.2.108.
11. Arab K, Altamimi L, Al-Otaibi H, Kattan A, Gelidan AG. Salvaging exposed cochlear implants. Plast Reconstr Surg Glob Open 2021;9:e3899. https://doi.org/10.1097/GOX.0000000000003899.
12. Eun SC, Kim SY, Kim CS, Koo JW. Temporalis myofascial flap coverage for extrusion of internal device after cochlear implantation. Int J Pediatr Otorhinolaryngol 2016;91:124–7. https://doi.org/10.1016/j.ijporl.2016.10.023.

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