

Case Report

Surgical modification for redo mastoidectomy in the presence of a large postauricular keloid: a case report and literature review

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ABSTRACT

Postauricular keloids may complicate mastoid surgery by obscuring landmarks, restricting flap mobility, and increasing recurrence risk. Their presence demands surgical modifications to ensure both safe disease clearance and stable wound healing. A 19-year-old male from a Malaysian indigenous tribe presented with recurrent cholesteatoma and a large postauricular keloid (8×3 cm) following prior mastoidectomy. The keloid limited access and distorted anatomy. Steroid injections were ineffective. A single-stage redo modified radical mastoidectomy with type IV tympanoplasty, meatoplasty, and keloid excision was performed. Elliptical incision, wide undermining, meticulous hemostasis, layered closure, and mastoid bandaging achieved tension-free healing. At six months, the ear remained dry without recurrence of cholesteatoma or keloid. Single stage mastoidectomy with keloid excision is feasible. Careful surgical technique with simple measures such as wide undermining and compression bandaging may obviate the need for adjuvant therapy in selected patients.

Keywords: Cholesteatoma, Mastoidectomy, Keloid, Postoperative complications

INTRODUCTION

Keloids are benign fibroproliferative scars characterized by excessive fibroproliferation and collagen deposition.¹ While often regarded for its cosmetic concerns, they can significantly hinder surgical access. In otologic surgery, particularly mastoidectomy, wide exposure and reliable anatomical orientation are critical for safe cholesteatoma clearance and long-term disease control. Large postauricular keloids may obscure landmarks, restrict flap mobility, and increase wound tension, all of which complicate surgical access and predispose to recurrence.² Despite extensive descriptions of keloid excision in plastic and dermatologic literature, their management in the context of revision mastoid surgery remains poorly characterized, leaving a gap in practical guidance.

We present the first reported case of a single-stage revision mastoidectomy with postauricular keloid excision. This

report outlines technical strategies that optimize exposure, reduce recurrence risk, and achieve acceptable cosmetic outcomes. It underscores that even seemingly minor scars can significantly influence otologic surgery.

CASE REPORT

A 19-year-old male from a Malaysian indigenous tribe presented with a two-year history of persistent left ear discharge and progressive hearing loss. Otoscopic examination revealed a central tympanic membrane perforation with keratin debris, while high-resolution computed tomography demonstrated soft tissue encasing the ossicles and eroding the scutum and tympanic annulus. He underwent a left modified radical mastoidectomy with good postoperative recovery, and the ear remained dry.

Three years later, he re-presented with recurrent otorrhea unresponsive to topical antibiotics. Examination revealed

a neo-tympanic membrane with an attic retraction pocket containing keratin debris, consistent with recurrent cholesteatoma. Overlying the original incision was a large, firm postauricular keloid measuring 8.0×3.0 cm (Figure 1), first noted six months after the primary surgery. The keloid caused significant cosmetic disfigurement, obscured surface landmarks, and restricted skin mobility, thereby increasing the risk of wound tension and recurrence. Six preoperative intralesional triamcinolone (Kenocort) injections were administered, but the lesion showed no meaningful regression.

A single-stage revision mastoidectomy with keloid excision was planned to address both the recurrent disease and the obstructing scar. Surgery comprised a redo left modified radical mastoidectomy with type IV tympanoplasty, meatoplasty, and excision of the postauricular keloid. An elliptical incision encompassing the entire scar allowed complete excision while preserving adjacent healthy skin (Figure 1). Local infiltration with lignocaine and adrenaline was used to minimize bleeding. The incision was performed with a scalpel to reduce thermal injury, and meticulous hemostasis was achieved to limit inflammatory stimuli. Wide undermining facilitated tension-free closure, which was performed in two layers: absorbable sutures for subcutaneous tissue and interrupted non-absorbable sutures for the skin (Figure 1). A compression mastoid bandage was applied for two days to prevent hematoma formation and further reduce recurrence risk.

Postoperative recovery was uneventful. The patient was counseled on wound care, avoidance of scratching, and sunscreen use over the scar. At eight months, the ear remained dry with no evidence of keloid recurrence, and the scar had healed with an acceptable cosmetic result. Figure 2 provides a visual summary of the patient's clinical course.

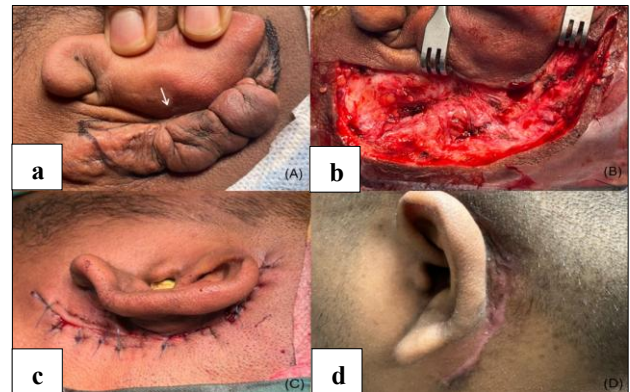


Figure 1: (a) Large postauricular keloid scar obscuring surgical landmarks prior to incision, (b) elliptical incision with complete excision of the keloid, preserving adjacent healthy skin, (c) immediate postoperative appearance following tension-free primary closure, and (d) healed postauricular wound at 8 months, showing no evidence of keloid recurrence and satisfactory cosmetic outcome.

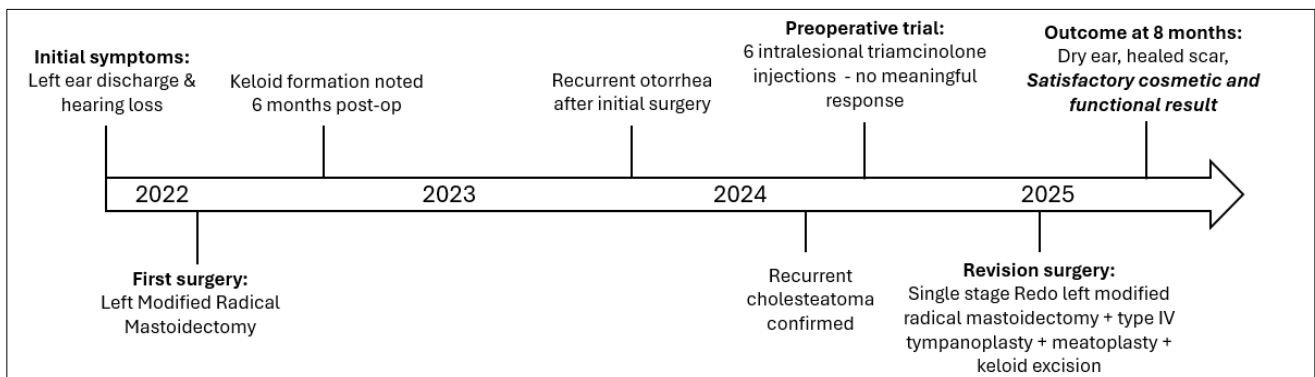


Figure 2: Case timeline of disease and treatment course.

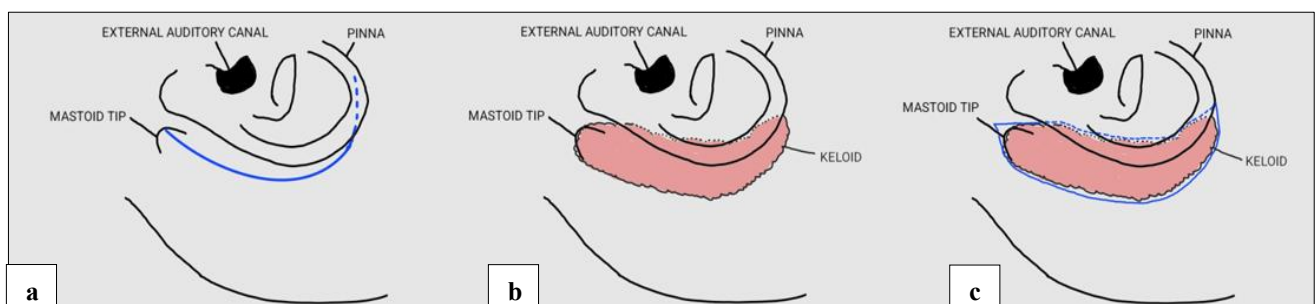


Figure 3: Schematic diagram illustrating: (a) the standard postauricular incision for mastoidectomy, (b) distortion from a postauricular keloid obscuring landmark, and (c) the revised elliptical incision enabling keloid excision with adequate mastoid exposure.

DISCUSSION

Adequate surgical exposure is essential for complete cholesteatoma clearance and a safe, dry ear. Large postauricular keloids can distort soft tissue anatomy, obscure landmarks such as the mastoid tip and spine of Henle and restrict flap mobility.² In our case, the keloid extended across the entire postauricular region, complicating orientation and limiting access. These distortions require modifications to conventional surgical approaches to ensure disease clearance and stable closure.

Several techniques have been described to reduce tension and improve outcomes in keloid-prone regions. Z-plasty can redistribute tension and improve scar appearance, while the retroauricular hairline incision (RAHI) provides a hidden, well-vascularized approach with minimal tissue trauma.^{3,4} More advanced strategies include S-shaped wound closure to redistribute tension, fascia-layer tension reduction, and the use of acellular dermal matrix with epidermal grafting to minimize tension in combined mastoid-keloid excisions.⁵⁻⁷ Although effective, these methods often require higher levels of surgical expertise and resources, limiting their reproducibility in routine otologic practice.

In this case, elliptical excision with wide undermining provided both exposure and tension-free closure (Figure 3). Studies show tension reductions of up to 83.3% with 5cm of undermining and 92.2% with 15 cm.⁸ This improves flap mobility, providing adequate exposure while supporting stable healing.⁹ This technique is straightforward, widely applicable, and easily integrated into standard mastoidectomy, making it a practical choice when managing keloids during revision surgery.

Meticulous hemostasis and dead space elimination are critical in preventing recurrence.¹⁰ Compression dressings such as mastoid bandage, further limit hematoma and inflammatory stimulus. Adjuvant therapies including intralesional corticosteroids, low concentration 5-fluorouracil, silicone-based pressure therapy, and radiotherapy have demonstrated efficacy in lowering recurrence.¹¹⁻¹⁴ These options remain valuable, particularly in high-risk patients.

Our patient achieved a favorable outcome without adjuvant therapy, highlighting that meticulous surgical technique and simple measures can sometimes suffice. Key lessons include anticipating keloid-related distortion, prioritizing hemostasis, employing wide undermining for tension-free closure, and using mastoid bandaging as an effective pressure device.

This case demonstrates that in selected patients, single-stage keloid excision with mastoidectomy is both feasible and effective, and it underscores the need for individualized, risk-based approaches in keloid-prone populations.

CONCLUSION

Postauricular keloids can significantly complicate mastoid surgery by distorting landmarks and limiting access. This case demonstrates that single-stage keloid excision with revision mastoidectomy is both feasible and effective when meticulous hemostasis, wide undermining, and tension-free closure are employed. Simple measures such as mastoid bandaging can achieve safe disease control and satisfactory cosmetic outcomes, underscoring the value of tailored, practical techniques in keloid-prone patients.

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