Closing the Gap, Closing the Drum

Endoscopic Push-Through Myringoplasty Using Tragal Cartilage in Aboriginal Patients in the Northern Territory

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BACKGROUND

- Otitis media affects 91% of Aboriginal children aged 6–30 months in remote Northern Territory and Central Australian communities — far exceeding the WHO 4% threshold for a major public health problem (1,2).
- Myringoplasty in Indigenous Australians has historically closed the drum in only 30–64% of cases, against roughly 90% in non-Indigenous metropolitan series (3–5).
- Conventional post-auricular and endaural approaches need hair shaving, larger incisions, longer theatre time and a microscope — poorly suited to remote outreach (3).

WHY THIS TECHNIQUE?

Technique selected for reasons of cultural safety and service delivery:

- **No hair shaving** — hair carries cultural and spiritual significance.
- **One small tragal incision only**; no post-auricular or endaural wound.
- **Short operative time**; no mastoid bandage.
- Day-case surgery, avoiding prolonged admission away from home.
- **Endoscope only** — no microscope, so the technique travels to remote theatres.
- **Care delivered closer to community**, reducing travel out of the region.

AIMS

- Report graft success and complications after endoscopic push-through myringoplasty using tragal cartilage in Aboriginal patients.
- Report audiometric outcomes.
- Describe a technique suited to Aboriginal health and remote outreach settings.

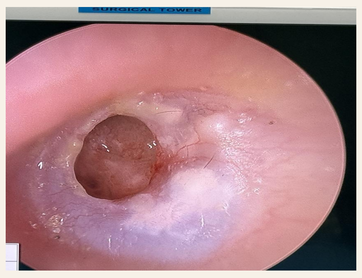
METHODS

Design Prospective audit.
Period May 2024 – October 2025.
Setting Royal Darwin Hospital and remote Northern Territory ENT outreach.
Patients Aboriginal patients undergoing myringoplasty.
Technique Transcanal endoscopic push-through myringoplasty using a tragal cartilage–perichondrium composite graft, after Tos. (6)
Follow-up 2 weeks and 2–3 months, with audiometry at final review.
Outcomes Graft integrity, complications, and pre- and post-operative pure-tone average (PTA).

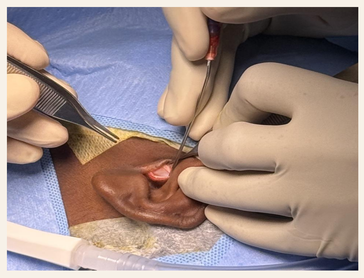
Northern Territory: patients drawn from Darwin and remote outreach sites.

SURGICAL TECHNIQUE

Transcanal endoscopic approach. A tragal cartilage–perichondrium composite graft is trimmed to the perforation and pushed through it, with the perichondrial cuff tucked medially. No canal-wall incision and no tympanomeatal flap are required.



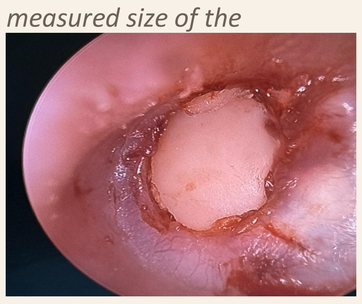
A. Perforation assessed transcanal with the



B. Tragal cartilage–perichondrium graft harvested

C. Graft trimmed to the measured size of the

D. Graft delivered transcanal and pushed through the



E. Graft seated at the end of the procedure; perichondrium tucked medially.

F. Intact tympanic membrane at post-operative review.

GRAFT OUTCOME

84%

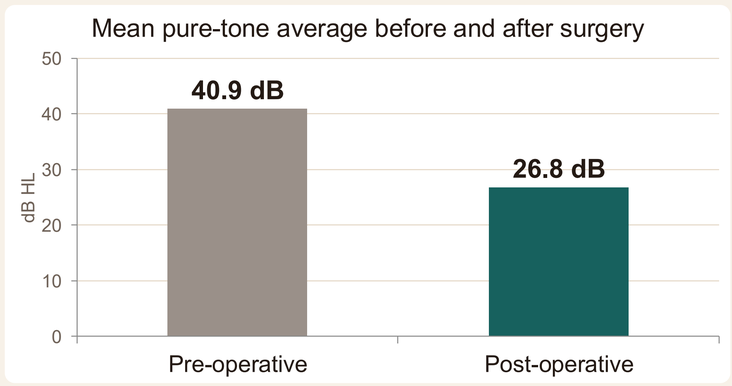
Intact graft at final review
21 of 25 patients
95% CI 65.3–93.6%

Failures: 4 of 25
Graft failure — 3
Residual perforation at 2 months — 1

Healed neotympanum after endoscopic push-through cartilage myringoplasty.

HEARING OUTCOMES

Pre-operative PTA	40.9 dB (SD 17.3)
Post-operative PTA	26.8 dB (SD 17.7)
Mean improvement	**14.1 dB (SD 7.7)**



Lower thresholds indicate better hearing. Air-conduction pure-tone average.

STUDY COHORT AND FOLLOW-UP

Follow-up status	n	%
Total patients operated	42	100
Completed full follow-up	25	59.5
Attended 2-week review only	7	16.7
Lost before 2-week review	10	23.8

25 patients were available for final outcome analysis. Loss to follow-up: **40.5%**.

COMPLICATIONS

- Infection in 2 patients — both resolved with antibiotics.
- No sensorineural or new conductive hearing loss.
- No chorda tympani injury.
- No canal stenosis.

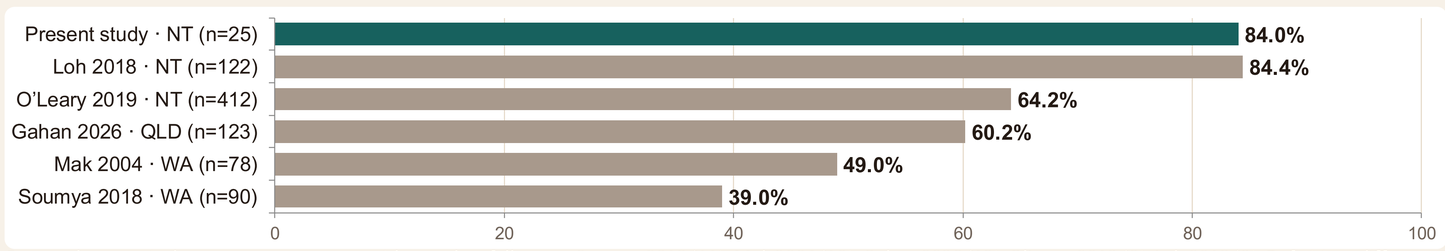
PATIENT CHARACTERISTICS (n = 25)

Sex	Male 11 (44%) · Female 14 (56%)
Age	7–66 years; mean 31 years
Perforation size	Subtotal in 40%
Graft cartilage	Tragal 23 · Conchal 2
Revision cases	3
Follow-up	2–16 months

DISCUSSION

- Cartilage offers structural stability and resistance to infection (7,8) in ears carrying a heavy burden of chronic middle ear disease.
- Avoiding a canal incision preserves the blood supply to the graft bed and avoids chorda tympani exposure.
- Loss to follow-up remains the dominant limitation, as in every published Indigenous Australian series.

OUTCOMES IN CONTEXT — PUBLISHED INDIGENOUS AUSTRALIAN MYRINGOPLASTY SERIES



Reported anatomical outcome among cases with complete follow-up: Soumya 2018 (11), Mak 2004 (10), Gahan 2026 (12), O'Leary 2019 (9), Loh 2018 (3). Definitions differ — Mak 2004 reports closure with an air–bone gap <25 dB, the others report tympanic membrane closure or graft integrity. Follow-up intervals, age range and case mix also differ, so these figures are indicative rather than directly comparable.

CONCLUSION

- Endoscopic push-through myringoplasty with tragal cartilage achieved an 84% graft success rate and a mean 14.1 dB hearing gain in this Aboriginal cohort.
- Minimally invasive, microscope-independent and day-case — practical for remote outreach and aligned with patient and community preferences.
- Longer follow-up and larger numbers are needed; reducing the 40.5% loss to follow-up is the key priority.

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Clinical images reproduced with patient consent. No competing interests declared.