

# Repair of Cerebrospinal Fluid Leaks of the Temporal Bone via a Trans-mastoid: An Updated Single Center's Experience



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## Introduction

Temporal bone cerebrospinal fluid (CSF) leaks present with non-specific symptoms of aural fullness, hearing loss, tinnitus, imbalance and headaches. They pose a significant challenge in neurosurgery, requiring meticulous repair to prevent complications such as infection, meningitis, cranial nerve deficits and seizures. Without resolution, mortality rate is 33% in adults<sup>1</sup>.

CSF leaks can be repaired via a middle cranial fossa (MCF), transmastoid (TM) or combined approach. While the MCF approach allows an enhanced exposure to the tegmen and preservation of hearing, the TM approach has the advantage of access to both tegmen and posterior fossa plate while avoiding a traditional craniotomy and temporal bone retraction.

Herein, we report on our experience of using the trans-mastoid approach as a first option for CSF leak repairs.

## Objectives

The objective of this study is to expand our previously reported data from a single center's experience of the use of the TM approach for the repair of temporal bone CSF leaks.

## Methods and Materials

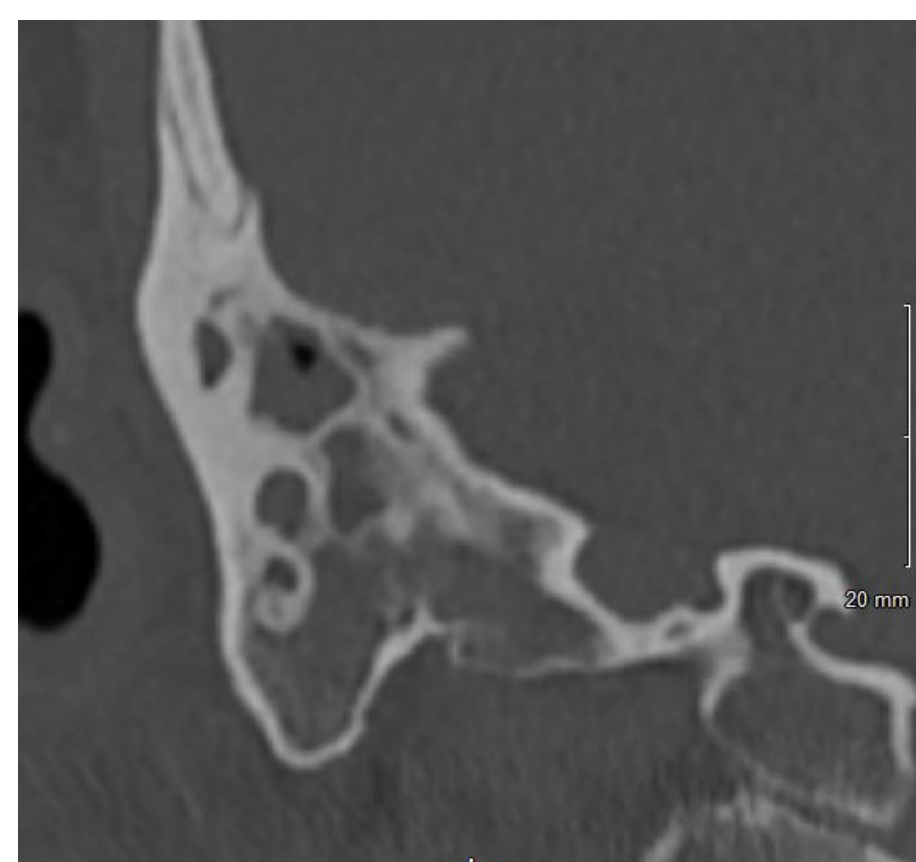
A retrospective analysis was conducted on eighteen consecutive patients with temporal bone CSF leaks who underwent surgical repair at our institution between 2018 and 2024.

Patient demographics, surgical details, postoperative complications, and outcomes were collected and analyzed.

## Select Examples



**Figure 1.** CT temporal bone showing opacification of left epitympanum; ossicular chain erosion, particularly of the incus, and anterior tegmen tympani erosive change



**Figure 2.** CT temporal bone showing near complete mastoid air cell opacification with thin tegmen

## Results

Twenty four patients underwent TM approach, involving a small retro-auricular incision and minimal bone removal. Mean age was 58.7 (SD 10.8). Eleven (45.8%) were female. There were no immediate or long term post-operative complications. CSF leak repair was successful with only the TM approach in 22/24 cases (91.7%).

One patient underwent MCF as a rescue procedure following recurrence of CSF leak.

One patient required placement of a ventriculoperitoneal shunt given a large defect and history of idiopathic intracranial hypertension.

Stable to improved hearing was reported in 17/24 (70.8%) cases. Post-operative hearing status was not reported in 2/24 (8.3%) cases.

There were no mortalities in this series.

## Discussion

The TM approach to repair temporal bone CSF leaks can be highly successful and in select cases can be non-inferior to the traditional intracranial MCF approach. While the MCF approach affords the ability to inspect the entire middle fossa floor and better hearing preservation, it does so at the expense of temporal lobe retraction. Our study demonstrates that the TM approach to temporal bone CSF leak repairs is a safe technique with comparable recurrence rates of prior reported series. Hearing preservation is achievable in a large proportion of patients. Further research and long-term follow-up studies are warranted to confirm the enduring benefits of this approach and its potential applicability in a broader range of neurosurgical procedures.

## Conclusions

Transmastoid approach repair of CSF leaks of the temporal bone can be done safely as the first line of treatment.



## References

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