Temporal Bone Dehiscences:
A Single-Center Case Series with Cadaveric Illustrations

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Introduction

The petrous portion of the temporal bone contains the middle and inner ear structures, making them susceptible in cases of dehiscence.
Temporal bone dehiscence (TBD) can present asymptomatically or with complex syndromes depending on their location, integrity of the dura, and the tissue that is herniated. Common variations include tegmen dehiscence (TD) and superior semicircular canal dehiscence (SSCD).
Surgical treatment aims to repair communication between the middle/internal ear, mastoid, and intracranial compartments.
This study reports our 7-year experience with TBD repairs using a middle cranial fossa (MCF) approach with multilayer reconstruction technique including cadaveric dissection emphasizing relevant surgical anatomy. The potential role of idiopathic intracranial hypertension (IIH) as a contributing factor is also discussed, highlighting the importance of monitoring intracranial pressure in these patients.

Materials and Method

This retrospective cohort study analyzed patients who underwent TBD repair at the Department of Neurological Surgery, The Ohio State University, Wexner Medical Center, OH, USA between 2016 and 2023. We evaluated demographic data, preoperative assessments, neuroradiological findings, prior treatments, intraoperative findings, postoperative symptoms resolution, and complications.

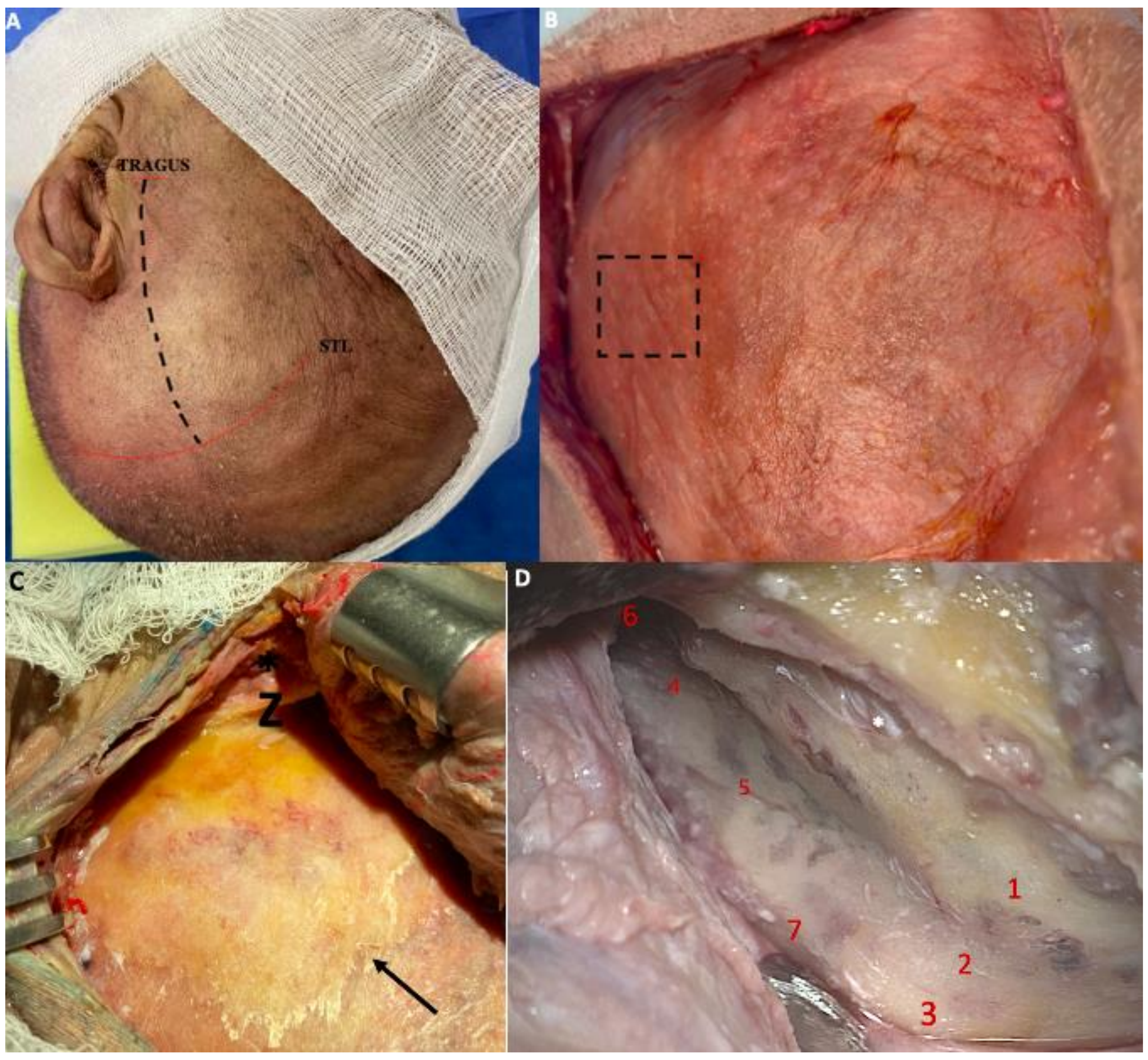

Figure 1. Cadaveric illustrative cases of the MCF approach.
1. Tegmen mastoideum 2. Tegmen tympani 3. Arcuate eminence 4. Lesser petrosal nerve groove 5. Greater superior petrosal nerve groove 6. Foramen spinosum 7. Meatal plane

Results

33 TBD repairs through the MCF approach were performed on 29 patients, with 4 treated bilaterally. Preoperative symptoms included hearing loss (89.6%), cerebrospinal fluid otorrhea (62%), aural fullness (44.8%), pulsatile tinnitus (44.8%), and dizziness/vertigo (34.4%). Four patients had a prior IIH diagnosis. A multilayer reconstruction technique was utilized based on requisite reconstructive needs. In 24 cases, encephaloceles were removed, and dural defect repaired. Subjective symptomatic improvement was observed in 28 patients (96.5%). After surgery, lumbar punctures identified 9 new IIH cases, allowing prompt treatment and reducing recurrence risk.

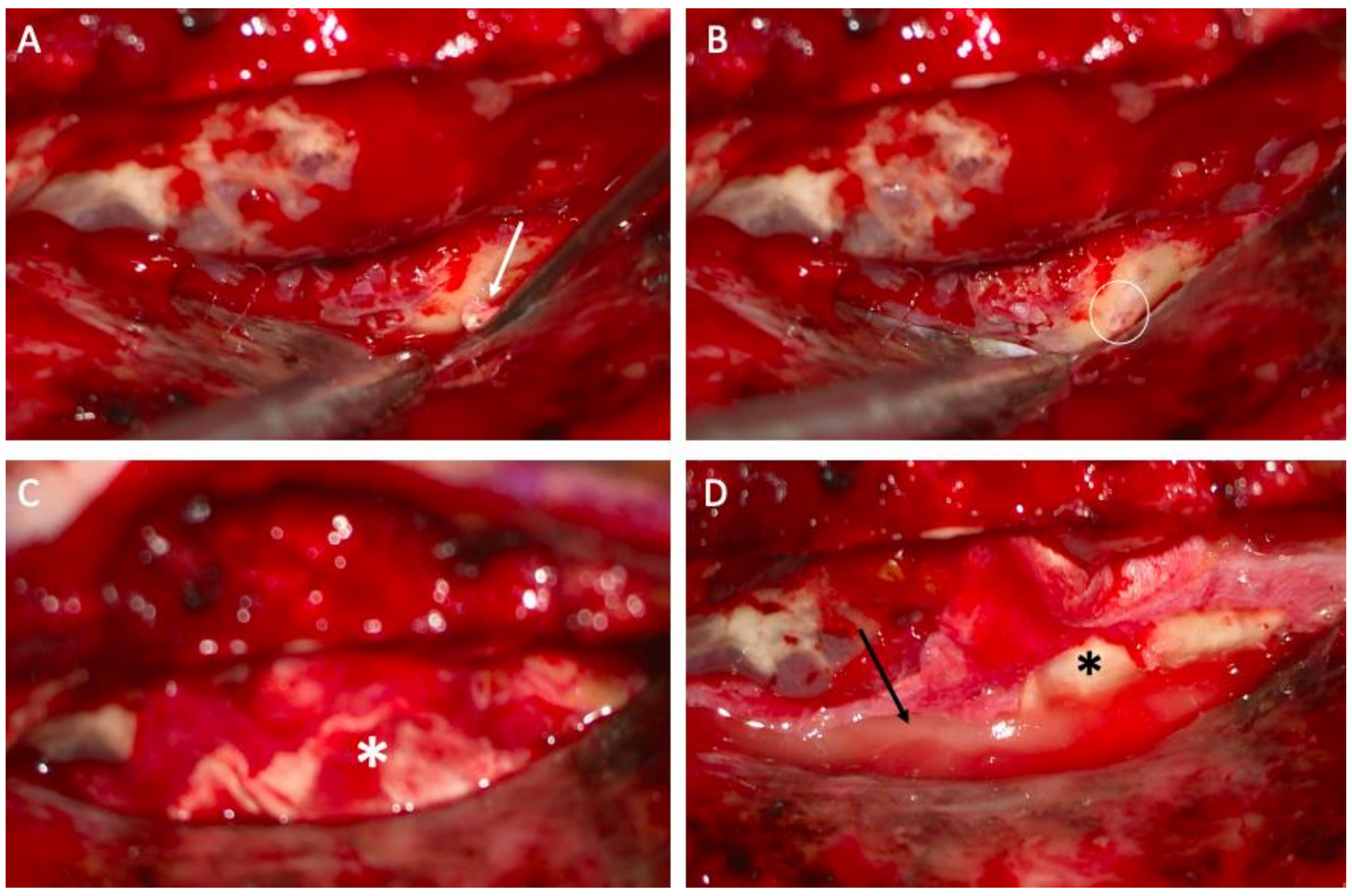

Figure 2. Intraoperative images of our multilayer technique
A) Small piece of temporalis fascia (white arrow)
B) Bone wax (white circle)
C) Large piece of temporalis fascia (white asterisk)
D) Split calvarial bone graft (black asterisk) and collagen matrix (black arrow).

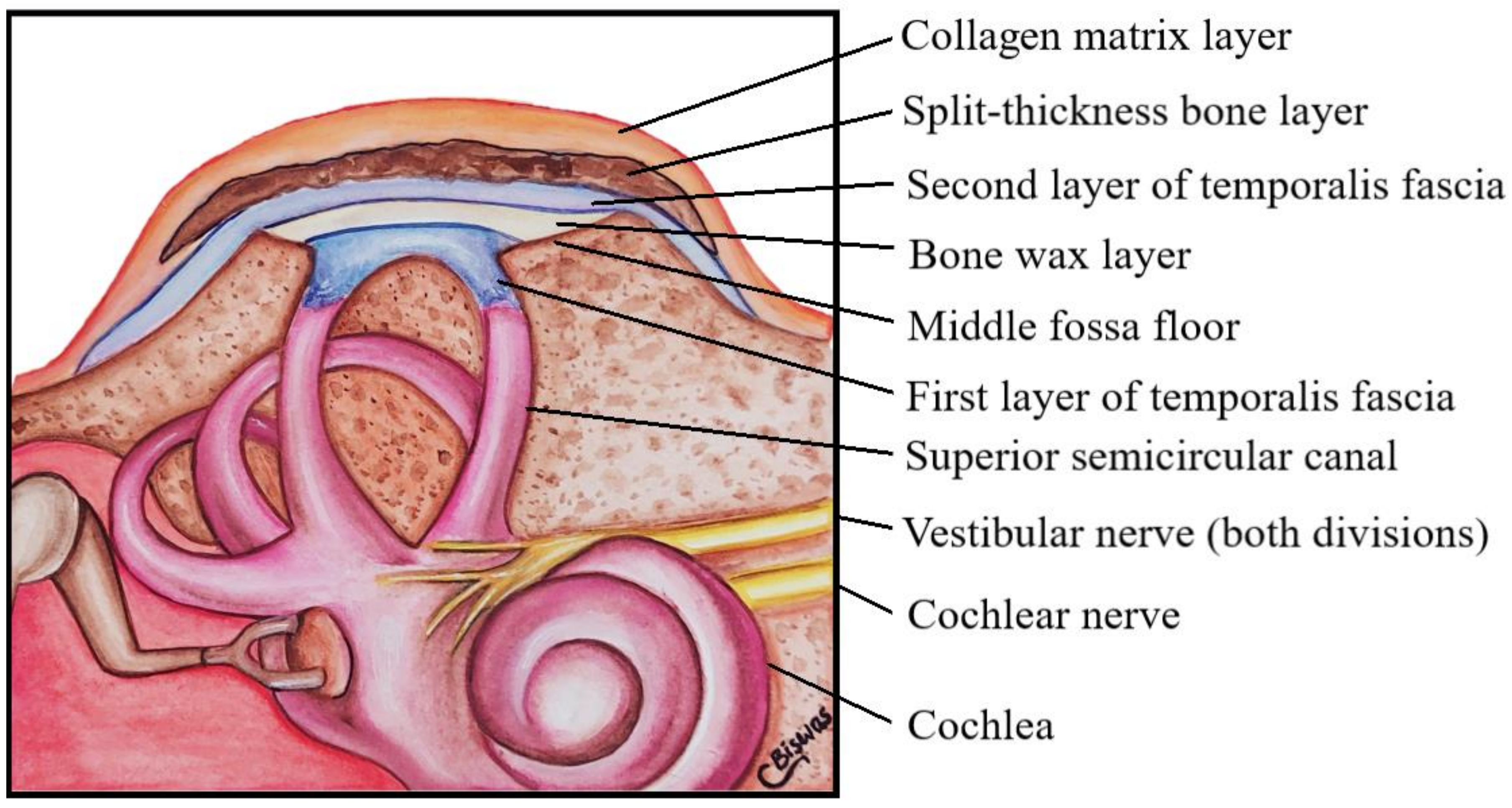

Figure 3. **Schematic illustration of the materials used for dehiscences repair**

Conclusion

The MCF approach for TBD repair using a multilayer reconstruction technique yields favorable outcomes, improving symptoms and reducing complications. Intracranial pressure should be monitored due to the potential association between TBD and IIH.