

# Radiographic Findings vs Intraoperative Findings in Middle Cranial Fossa Encephalocele Repair



## Background

Temporal bone encephalocele is associated with chronic otitis media, mastoiditis, hearing loss, cerebrospinal fluid (CSF) leak, and meningitis. The ability to diagnose tegmen defects, early encephalocele, and true encephalocele is paramount. Computed tomography (CT) radiography is the gold standard for diagnosing bony abnormalities of the temporal bone; however, true diagnosis is difficult due to the nature of CT imaging and skull base thickness. To determine the predictive value of CT scans for temporal bone encephalocele, we compared preoperative CT findings with intraoperative findings during middle cranial fossa (MCF) repair. We hypothesized that CT scans underreport the true prevalence of encephaloceles.

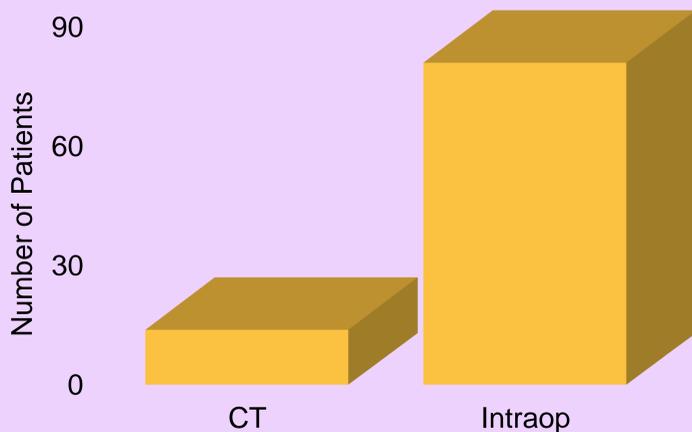
## Methods

Our retrospective cohort study included all MCF repairs performed by a single team of surgeons at a tertiary care facility between 2021 and 2025. All patients taken to the OR were diagnosed with encephalocele by the primary surgeons based on their interpretation of temporal bone CT. The primary outcomes were radiographic encephalocele diagnosis and intraoperative encephalocele diagnosis.

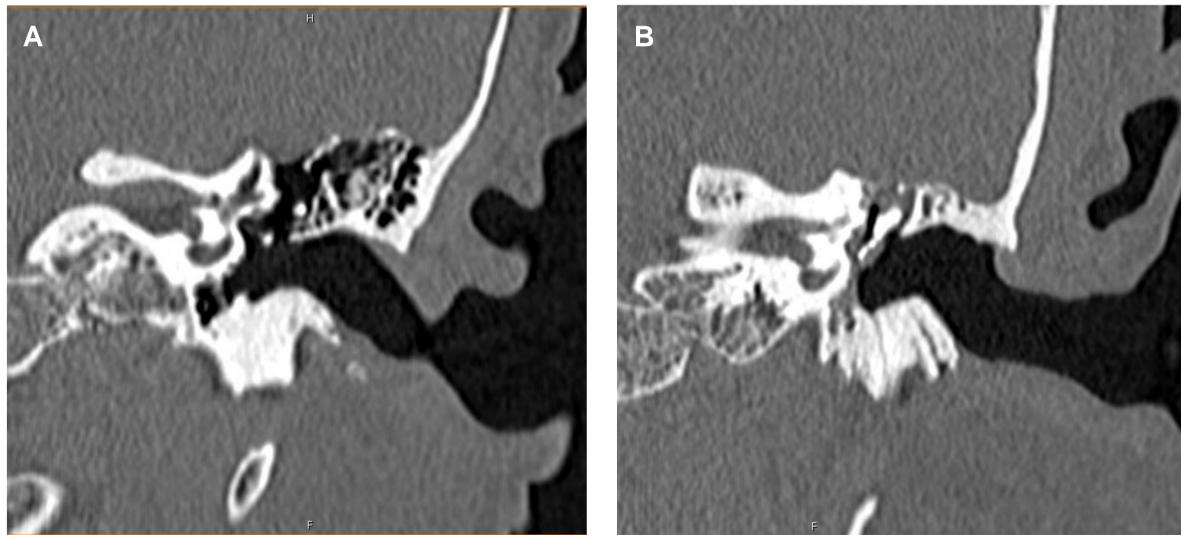
## Results

A total of 116 procedures were performed. Only 14 (13.7%) tegmen defects were interpreted as encephalocele by a radiologist on preoperative CT, whereas 81 (70.4%) were found to have encephalocele under direct visualization (**Figures 1-2**). Intraoperatively, a CSF leak was noted in 18 (15.7%) patients, and granulation tissue or dural inflammation was noted in 11 (9.6%) patients. There were no significant differences when stratified by laterality or gender.

### CT vs Intraop Encephalocele



**Figure 1:** Bar graph shows the number of patients with encephalocele diagnosed on imaging ("CT," n=14) versus intraoperatively ("Intraop," n=81).



**Figure 2:** Representative preoperative CT scans. (A) Temporal bone CT in the coronal plane showing left-sided encephalocele that was diagnosed both on radiography and during surgery. (B) Temporal bone CT in the coronal plane showing left-sided encephalocele that was not diagnosed on radiography but was observed in the operating room under direct visualization.

## Conclusion

The number of encephaloceles identified on CT was significantly fewer than those observed intraoperatively. This suggests that many are not reported on routine CT workup with our data showing a sensitivity of only 17.3%. Further investigation should evaluate the risk of untreated encephaloceles. Otolologists and neurosurgeons should have a lower threshold for encephalocele repair in patients with symptoms or high risk factors.