

INTRODUCTION

- Perilymphatic fistulae (PLF) are abnormal communications between the perilymph-filled inner ear and the air-filled middle ear and mastoid or cranial spaces, and etiologies include head trauma, otic capsule dehiscence, and barotrauma
- Barotrauma-induced PLFs result from increased middle ear pressure from activities associated with increased external pressures, such as SCUBA diving, or internal pressures, such as Valsalva
- Continuous positive airway pressure (CPAP), a common treatment for obstructive sleep apnea (OSA), can elevate middle ear pressures to supraphysiologic levels in patients with normal eustachian tube function
- Contemporary literature investigating the relationship between CPAP and PLFs is scarce, and the risk of CPAP use after middle ear surgery is unknown

CASE DESCRIPTION

- 47-year-old male with a history of otosclerosis and OSA treated with stapedotomy years prior and CPAP
- Presented with sudden unilateral hearing decline and otalgia unresponsive to antibiotics or steroids
- He denied any history of rapid pressure changes, such as sneezing. Surprisingly, he denied vertigo
- Physical exam demonstrated intact tympanic membranes and no middle ear fluid or nystagmus
- An audiogram demonstrated new profound right mixed hearing loss and stable mild left ear mixed hearing loss
- CT scan demonstrated a well-positioned stapes prosthesis and air in the vestibule consistent with pneumolabyrinth
- The patient was offered BiCROS hearing aids, exploratory surgery with fistula repair, or cochlear implantation.
- He elected for cochlear implantation with return of hearing to baseline and resolution of pneumolabyrinth

RADIOGRAPHY

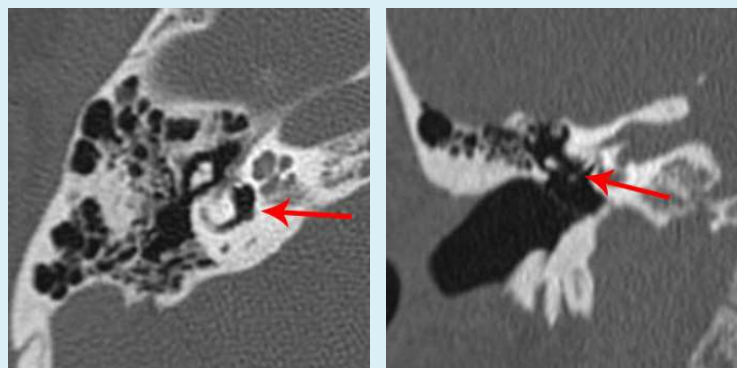


Figure 1 (a) Axial preoperative CT right temporal scan demonstrating vestibular air consistent with pneumolabyrinth and (b) well-positioned shepherd's crook stapes prosthesis

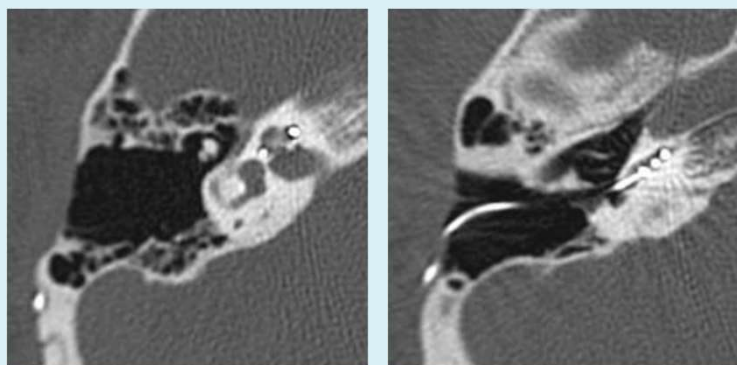


Figure 2 (a) Axial postoperative CT right temporal scan demonstrating resolution of pneumolabyrinth and (b) successful placement of cochlear implant

CONCLUSIONS

- Perilymphatic fistula (PLF) is a postoperative complication of middle ear surgery requiring vigilance even many years after operation
- Therapeutic CPAP can produce supraphysiologic middle ear pressures and impose barotrauma, potentially leading to PLF development
- Growing prevalence of OSA justifies more intentional identification of CPAP as a risk factor for postoperative complications in patients undergoing middle ear surgery
- Given the rare nature of this complication and its underexplored relationship with CPAP, the establishment of a national quality improvement database would enable further identification and examination of cases of delayed sudden sensorineural hearing loss

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