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To Balloon or Not to Balloon, The Current State of Management of Eustachian Tube Dysfunction

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Keywords

Eustachian tube dysfunction, otitis media, Eustachian tube dilation, Eustachian tuboplasty

While otologic complaints are a common reason for patients to present to an otolaryngologist, Eustachian tube dysfunction (ETD) remains a poorly understood disease whose management is unclear. Among the general population in the United States, ETD has a prevalence of 4.6% among adults and 6.1% among children.¹ Eustachian tube dysfunction is not just a common diagnosis for otolaryngologists, ETD accounted for 2 million visits for patients less than 20 years old to primary care providers and over 2 million visits for patients older than 20 years old between 2005 and 2012.² Despite the commonality of ETD, opinions differ wildly among otolaryngologist on the management of these patients.

One of the issues faced by otolaryngologists and primary care providers alike is the difficulty in clarifying the diagnosis of ETD. Patients will often present with aural fullness, popping, pain, pressure, clogging, and underwater sensation.³ The first challenge faced after a clinician suspects a diagnosis of ETD is to determine what type of ETD the patient may be experiencing. The patient history is key as is an appropriately focused physical examination and workup which considers 3 categories of ETD: (1) dilatory ETD, (2) Baro-challenge-induced ETD, (3) Patulous ETD.

Acute dilatory or obstructive ETD is commonly preceded by an upper respiratory infection or allergic rhinitis. Patients will report aural fullness and popping. There may be an associated otitis media. Chronic dilatory ETD is a long-standing presence of similar symptoms, typically not associated with an acute illness, though they may be exacerbated by one. Baro-challenge-induced ETD is brought on by changes in the ambient pressure. The patients usually are asymptomatic until a change in ambient pressure occurs. Scuba divers and flight crews are not infrequently afflicted. Patulous ETD is often misdiagnosed as dilatory ETD or baro-trauma-induced ETD. The distinguishing symptom of patulous ETD versus the other types is the presence of autophony.⁴ This editorial will primarily focus on dilatory and baro-trauma-induced ETD.

The diagnose of dilatory ETD is typically made based on the patients reported symptoms as well as negative pressure in the

ear based on clinical assessment, whether it be by tympanometry, otoscopy, or otomicroscopy. Baro-challenge-induced ETD is a diagnosis made based on patient history. Abnormal physical examination findings will typically be absent. The diagnoses of patulous ETD will also largely depend on the patient's history. Although, most commonly, the tympanic membrane and middle ear will appear normal, excursions of the tympanic membrane may be appreciated with ipsilateral nasal respiration performed while upright. A careful history is required to identify those patients who have or are suspected to have patulous ETD, as their treatment differs greatly from the others.

The management of ETD may be as challenging as its diagnosis. The first approach generally is to address the underlying cause or causes of ETD. Mucosal edema at the Eustachian tube orifice has been noted in 83% of patients with ETD.⁵ There is a strong correlation between mucosal inflammation and laryngopharyngeal reflux and allergic rhinitis.⁶ Because of this association, it is common practice to prescribe nasal steroids as first-line treatment for ETD. A study by Wang et al in 2017 showed that otolaryngologists continue to prescribe nasal steroids for the treatment of otitis media with effusion, despite level I evidence that intranasal steroids are no more effective than placebo in the treatment of ETD.^{7,8} The decision to prescribe nasal steroids should be made to specifically treat an

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associated condition thought to be contributing to ETD and not specifically to treat only ETD.

Traditionally, the gold standard for the treatment of ETD has been the placement of short-term ventilating tubes (VTs). Often the results are satisfactory but just as often once the short-term VT extrudes patients may require additional short-term VTs or sometimes long-term tubes. Patients are often left wondering if there is a more permanent and physiologic option. This demand has led to the development of many different tuboplasty procedures have been trialed including via nasopharynx, middle ear, preauricular, and middle cranial fossa approaches.

The otolaryngologist's familiarity with nasal endoscopy has led to the development of these new treatment options for ETD. In 2004, Kujawki and Poe described laser Eustachian tuboplasty via a mixed oropharyngeal and endoscopic approach but overall the results were mixed.^{9,10} In 2007, Metson et al performed a microdebrider tuboplasty on 20 patients already undergoing endoscopic sinus surgery who also had concurrent ETD. They reported an improvement in symptoms in 70% of their cohort.¹¹

In the modern era of balloons and sinonasal endoscopy, otolaryngologists have taken the logical step of combining the 2 to treat ETD. In 2010, Ockerman et al published the first study which explored the idea of the using sinus balloons to dilate the Eustachian tube.¹² The study of balloon dilation of the Eustachian tube (BDET) has since expanded to larger trials. Poe et al conducted a randomized prospective trial comparing BDET with medical management (MM) versus MM alone. In those that underwent BDET + MM, 51.8% experienced normalization of tympanograms at 6 weeks, versus 13.9% of the control, and 62.2% experienced normalization of their tympanograms at 24 weeks, versus 8.5% of controls.¹³ A follow-up study showed that these results were durable through 52 weeks.¹⁴

Given all of these available options, the question remains, what is the best treatment for patients with ETD? The first step we would recommend is to educate the patient on the natural history of the disease and attempt to diagnose and treat any underlying cause such as allergic rhinitis. In our opinions, the 2 best and safest options once conservative measures fail are VTs and BDET. Some patients will gravitate toward the definitive nature to VTs and some patients will gravitate toward the physiologic nature of BDET. Typically, the patients we find that decide on BDET are those who have undergone several sets of myringotomy tubes and are looking for an alternative. They express understanding that BDET may not work for them, but they are often willing to try it if it means possibly not requiring another set of VTs. Of course, there is paucity of long-term data at this time, but again, as long as the patient understands that, we feel it is reasonable to offer BDET as an alternative to VTs.

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References

1. Shan A, Ward BK, Goman AM, et al. Prevalence of Eustachian tube dysfunction in adults in the United States. *JAMA Otolaryngol Head Neck Surg.* 2019;145(10):974-975. doi:10.1001/jamaoto.2019.1917
2. Vila PM, Thomas T, Liu C, Poe D, Shin JJ. The burden and epidemiology of Eustachian tube dysfunction in adults. *Orig Res Otolaryngol Otolaryngol Neck Surg.* 2017;156(2):278-284. doi:10.1177/0194599816683342
3. Bhutta MF, Butler CC, et al. Eustachian tube dysfunction: consensus statement on definition, types, clinical presentation and diagnosis. *Clin Otolaryngol.* 2015;40(5):407-411. doi:10.1111/coa.12475.
4. Poe DS. Diagnosis and management of the patulous Eustachian tube. *Otol Neurotol.* 2007;28(5):668-677. doi:10.1097/mao.0b013e31804d4998
5. Poe DS, Gopen Q. Eustachian tube dysfunction. In: *Ballenger's Textbook of Otolaryngology.* Shelton, Conn.; Hamilton, Ont.; London: People's Medical Pub. House/B C Decker; 2009: 201-208.
6. Poe DS, Abou Halawa A, Abdel-Razek O. Analysis of the dysfunctional Eustachian tube by video endoscopy. *Otol Neurotol.* 2001;22(5):590-595. doi:10.1097/00129492-200109000-00005
7. Gluth MB, McDonald DR, Weaver AL, Bauch CD, Beatty CW, Orvidas LJ. Management of Eustachian tube dysfunction with nasal steroid spray: a prospective, randomized, placebo-controlled trial. *Arch Otolaryngol Head Neck Surg.* 2011; 137(5):449-455. doi:10.1001/archoto.2011.56
8. Wang DE, Lam DJ, Bellmont AM, Rosenfeld RM, Ikeda AK, Shin JJ. Intranasal steroid use for otitis media with effusion: ongoing opportunities for quality improvement. *Otolaryngol Head Neck Surg.* 2017;157(2):289-296. doi:10.1177/0194599817703046
9. Kujawski OB, Poe DS. Laser Eustachian tuboplasty. *Otol Neurotol.* 2004;25(1):1-8. doi:10.1097/00129492-200401000-00001
10. Miller BJ, Jaafar M, Elhassan HA. Laser Eustachian tuboplasty for Eustachian tube dysfunction: a case series review. *Eur Arch Otorhinolaryngol.* 2017;274(6):2381-2387. doi:10.1007/s00405-017-4476-0
11. Metson R, Pletcher SD, Poe DS. Microdebrider Eustachian tuboplasty: a preliminary report. *Otolaryngol Head Neck Surg.* 2007; 136(3):422-427. doi:10.1016/j.otohns.2006.10.031
12. Ockermann T, Reineke U, Upile T, Ebmeyer J, Sudhoff HH. Balloon dilatation Eustachian tuboplasty: a clinical study. *Laryngoscope.* 2010;120(7):1411-1416. doi:10.1002/lary.20950
13. Poe D, Anand V, Dean M, et al. Balloon dilation of the Eustachian tube for dilatory dysfunction: a randomized controlled trial. *Laryngoscope.* 2018;128(5):1200-1206. doi:10.1002/lary.26827
14. Anand V, Poe D, Dean M, et al. Balloon dilation of the Eustachian tube: 12-month follow-up of the randomized controlled trial treatment group. *Otolaryngol Head Neck Surg.* 2019;160(4):687-694. doi:10.1177/0194599818821938.